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1ST WEEK OF APRIL

Suppressors are the current rage in the shooting sports, with at least 40 states allowing ownership, and manufacturers are responding with multiple product options for rifles, pistols—and even shotguns! Learn everything you need to know about suppressors by watching this new segment, "Suppressors: Silence Is Golden."
Craig Boddington and Kyle Lamb team up to pass along their firearms knowledge—based on decades of experience in the field and at the range—in "Rifle Revolution." Craig handles the bolt-action rifle category while Kyle addresses features on his favorite platform—the AR.
2015 marks the 30th anniversary of Beretta winning the M9 contract (and 100th anniversary of building semiauto pistols), and in this new segment ("Banking On Beretta's M9/M92"), we call on a number of our and Beretta's resident experts—ranging from military veterans to law enforcement to people involved in the rigorous testing of the M9—to file these special reports.

2ND WEEK OF APRIL

The biggest and brawniest semiauto pistol made highlights this week's show, with Magnum Research's .50 AE Desert Eagle in the spotlight. Handgun Editor Patrick Sweeney offers his views on this behemoth, and while it doesn't necessarily shake the ground you're standing on when you pull the trigger, it lets you know you have a handful of pistol in your hands. Former special ops Tom Beckstrand offers personal perspective and interesting insight into an incredibly accurate load--Black Hills .308 Match-- and then we turn our attention on how to handle all the paperwork involved in purchasing/owning a suppressor.

3RD WEEK OF APRIL

Amazingly (by today's standards), when first introduced, suppressors were considered "mainstream" and could be shipped in the mail…and there's a lot more interesting history to suppressors as we show an old Colt Woodsman .22 with original suppressor. Amazing and intriguing to say the least…
We check out Stag Arms' new 9mm carbine in our At The Range segment, along with S&W's new M&P 9mm pistol and M&P-15 .223—with threaded barrels and suppressors. You'll be amazed at the difference a suppressor makes.
Finally, Boddington and Lamb talked about "enhanced triggers" in both and AR firearms and Beretta offers a behind-the-scenes report into the actual "torture" testing of the M9 leading up to Beretta winning the contract 30 years ago.
(more)

4TH WEEK OF APRIL

From modern day firearms to historically significant models, we kick off this week's show with SIG's cutting edge Model 320 Conversion kit. It is an extra special package in terms of a striker-fired modular pistol platform, and we give it a run thru at the range. A recognized name from the past—from the World War II era—is back with a gun from the past as Inland Manufacturing reintroduces the M1 carbine it produced in the 1940s. It's almost an exact reproduction of the original, and better yet, they're found a way to improve the accuracy of the little carbine, which is also available with a folding stock.
Finally, we close out the show by accessing a sound meter to measure noise in this suppressed/unsuppressed segment. Your eyes (and ears) may be surprised by the results we uncover.
And Craig Boddington and and Kyle Lamb talks about transitioning from the Model 1911 to the M9 in our Banking On Beretta segment.

1ST WEEK OF MAY

Ruger's ever-popular GunSite/Scout rifle is chambered in a new caliber--.223—and even better news is that it is being offered with a threaded barrel so you can screw on a suppressor of your choice and fire away with considerably less report. Significant advancements in optics is Leupold's long-standing reputation, and 2015 will be no different as it introduces its LCO. Curious what this optic has to offer? Tune in for this exclusive report.
"Option overload" may be a term you've come to use when trying to decide which suppressor is best for you and a specific firearm. We jump right into the mix and sort out some of what's available and potentially what some of the best options are for you, whether target shooting or hunting. You won't want to miss this report.

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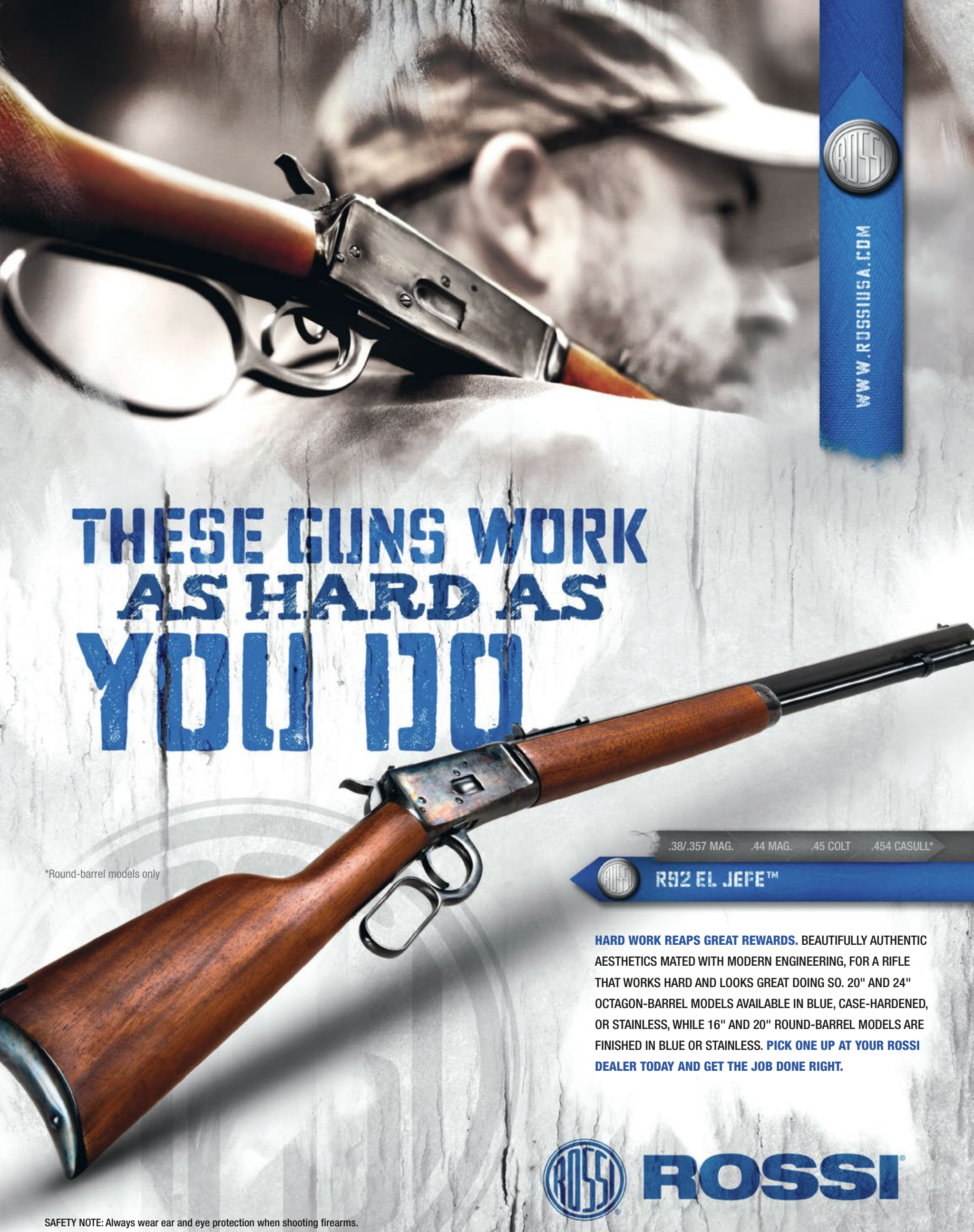

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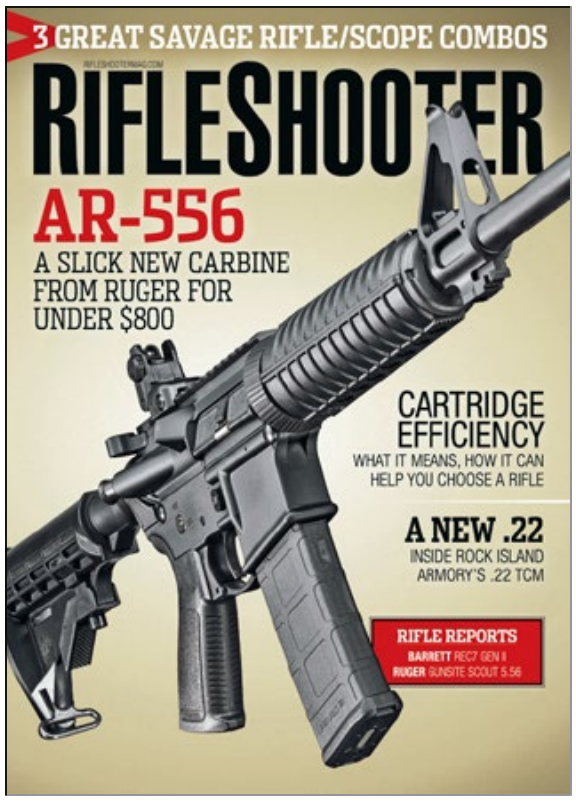

A Convert!

While I do own several rifles, I never considered myself a rifle crank. However, I must admit I certainly enjoy reading your articles about the more technical aspects of rifle shooting like ballistic coefficients, efficiency, bullet performance and the like. And "Cartridge Clash" is always fun. So I guess you've turned me into a rifle crank! Keep up the good work.

Ken Heard
Dallas, TX

The 70/77 Face-Off

I really enjoyed Sweeney's article with the comparison of the Winchester 70 and the Ruger 77 (January/February), especially since I have a Model 77—not a Hawkeye but the original M77 version. Sweeney's chronology of the M77 changes is off, though. He states a change to the integral scope base was made the same time as the safety relocation to the cocking piece, but the M77 I have is a 6mm Rem. purchased new in 1977. It has both the integral bases and the tang safety. Back then a drilled and tapped "round-top" version was available as an option, but the integral base was standard. This rifle was accurate out of the box with any weight bullet 60 to 100 grains grouping three shots under an inch handheld off a bench. I shoot groups handheld for the extra challenge and because it better mimics use in the field. This M77 is a forever keeper.

Joe Talamini
Hopedale, MA

Really enjoyed Patrick Sweeney's article "Crunching The Numbers." Having owned both a pre-'64 Model 70 and a '70s-era Model 77, I could relate to many of his points. The obvious and unanswered question raised for me is: What about the current Model 70? I'm shopping for a new rifle and find a lot to like in Winchester's recent models.

Allan Kroeker
Niverville, Manitoba

Ham-Handed or -Headed?

I would like to offer a few tips in regard to J. Scott Rupp's article on replacing a recoil pad ("The Ham-Handed Gunsmith," March/April). Rather than risk damaging the stock with the saw blade, measure the depth of the freshly drilled hole and pre-cut the dowel 1/8-inch shorter, apply waterproof wood glue to both surfaces with a cotton swab and tap the dowel in flush with the end of the stock.

Once the glue has set up, finish the end grain of the buttstock with a quality stock finish and allow to dry. Before you finish the installation, run masking tape around both pad and buttstock just a whisker back from the joining edges, then apply a small bead of color matching silicone sealant to the inside perimeter of the buttstock face. Now position and tighten down the pad, immediately wipe off any excess sealant squeezed from the joint, remove the tape, and allow to dry. You should now have a gap-less, completely weatherproof installation.

Lynn Shives,
Smithsburg, MD

Why would you have gone to such trouble custom cutting a dowel for that job when outfits such as Harbor Freight and Rockler make pre-cut wood joint dowels just for that purpose, complete with tapered ends to seat into the drill tip pocket and all? (You'd of course nip off the outer end to be flush with the stock.)

M.J. McGowan
South Glens Falls, NY

The Ham-Handed Gunsmith thanks both of you gentlemen. He'll be calling you before undertaking his next project.

Cartridge Efficiency

I just read Brad Fitzpatrick's excellent article on cartridge efficiency (March/April), and as is the norm for *RifleShooter*, it was informative and well-written. Brad mentions several popular 6.5 caliber rifle cartridges that meet his efficiency criteria, but he missed one I believe to be more popular than some of the others he listed: the 6.5 Grendel.

My Alexander Arms 19.5-inch upper receiver, thrown on a Colt 6920 lower, routinely shoots 0.4 m.o.a. or better with Hornady factory 123-grain A-Max ammo and almost as good with my 120-grain GMX and 123-grain SST reloads.

Nicholas C. Gottuso
Menlo Park, CA

Much thanks to Brad Fitzpatrick for a great article about cartridge efficiency. It is the continually informative articles like this one that will keep me as a subscriber to *Rifleshooter*. Your findings confirm my load data and chronograph results that large cartridges give more velocity but at the expense of less efficiency.

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I do have one nitpicky disagreement with your statement that "...high velocity bullets reduce barrel life." I believe the culprit is the larger powder charges that usually accompany high velocity bullets. I can't see how high velocity bullets reduce barrel life. With equal pressures, heavier bullets with their lower velocities will cause the powder to burn for a longer time in our barrels and would reduce barrel life at a slightly higher rate.

Kim Scott
Bellingham, WA

Nosler vs. Weatherby

I just read your November/December issue and found the article on the Patriot rifle chambered in the new .26 Nosler cartridge to be of interest. Being a fervent collector of Weatherby rifles, I wondered if it were time to switch to the Nosler rifle to gain the advantage of more velocity.

However when scanning the performance of the .270 Wby. cartridge and the new .26 Nosler cartridge, I noted that the ballistics of these two cartridges with a 140-grain bullet are identical: 3,300 fps for both! Unless the ballistic coefficient or trajectory for the Nosler bullet is significantly better than the 270 Wby., then I can't really see any advantage to going to the new .26 Nosler-chambered gun.

Mike Caddell,
South Padre Island, TX

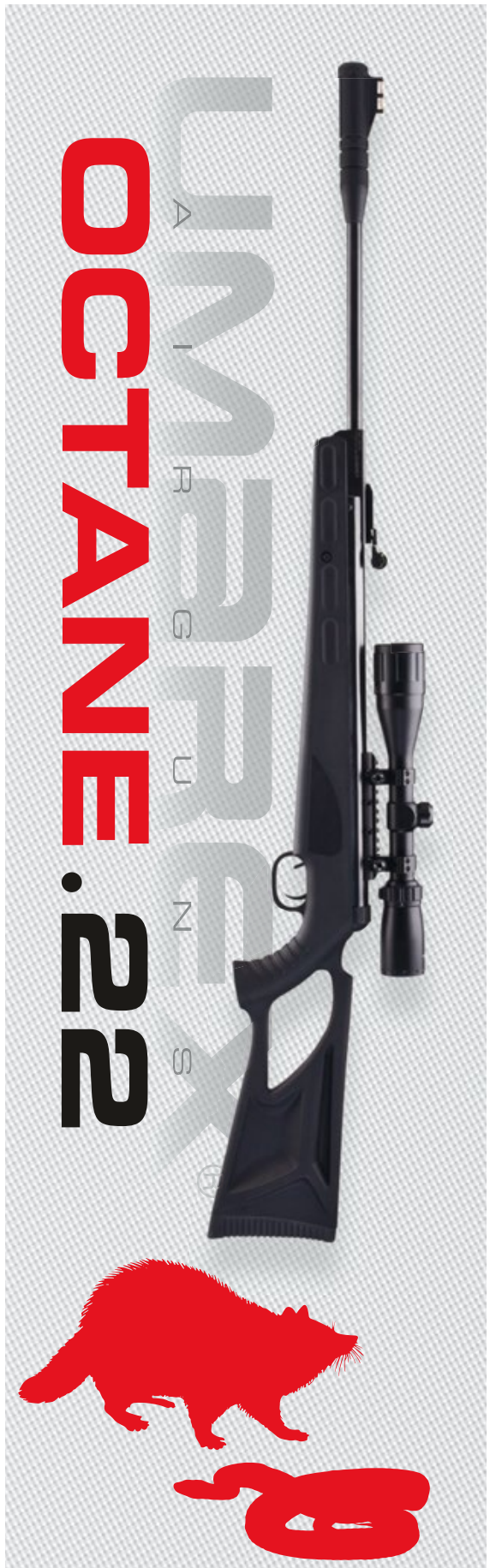
The 140-grain AccuBond—factory loaded in both cartridges—has a BC of 0.496 in .277 diameter and 0.509 in .264 diameter. I ran both through a ballistics program using the same 200-yard zero: The .270 Wby. drops 5.2 inches at 300 and 15.2 at 400; the .26 Nosler drops 5.2 and 15.0 respectively. So no difference. The 6.5 does have a sectional density edge over the .270, 0.287 to 0.261.—JSR

That's Slack

Describing a rifle's trigger is an important aspect of reviewing that firearm, and we have commonly accepted and understandable terms such as take-up (free motion of the trigger prior to the engagement of the fire control mechanism), creep (the relative sliding of sear and fire control mechanism surfaces prior to sear disengagement) and over-travel (motion of the trigger after sear disengagement). So why does Stan Trzoniec persist in using the term "slack" in describing a trigger?

Gordon F. Shymko
Calgary, Alberta

Paul Weston, a famous competitive handgun shooter, described it this way: "Slack is a loose, internal trigger movement that occurs in automatics (that has seemed to begin) with a military origin. Effective trigger motion requires the shooter to 'take up' the slack in a rapid and firm initial pressure until there is a distinctive stop of the trigger." In other words, "slack" is simply another term for "take-up," and it's been in common use for years.—Stan Trzoniec



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LOOKING FOR A NEW STOCK FOR A BUILD OR UPGRADE? MCMILLAN HAS YOU COVERED.

By J. Scott Rupp

As Jon Sundra notes in his article on the new Mossberg Patriot elsewhere in this issue, a rifle's stock has everything to do with how a gun is perceived. Looks count for a lot. But stocks are obviously more than window dressing. They are the foundation for your barreled action, affecting barrel vibrations and contributing to accuracy. They are also your interface with the rifle. How well you shoot a gun is hugely influenced by how well the stock fits or how easily you are able to conform to its dimensions.

If you want to dress up a favorite old beater or breathe new life into a rifle that's been relegated to the back of the safe (and possibly make it a better shooter in the process), replacing the stock can be the ticket. And if you're building a custom gun—whether DIY or through a 'smith who leaves stock choice up to you—you're going to have to figure out what the rifle will wear.

I found myself facing this question while contemplating a rifle rebuild. So I borrowed three stocks from McMillan (McMillanUSA.com) and shot them on a standard-contour Remington Model 700 in .280 Rem. The three stocks—Remington Mountain Rifle, McMillan Hunter and Game Scout—barely scratch the surface of the models McMillan offers. It builds custom stocks for about any rifle action you can think of, in a wide variety of painted and molded-in finishes.

Of my samples, the Mountain Rifle and McMillan Hunter have their patterns molded in, while the Game Scout is painted. All three are what the company calls "custom drop-in"—a package including a completely inletted stock with painted or molded-in finish, Decelerator or Limbsaver recoil pad and machine-screw swivel studs. Mine came with pre-installed, machined-in bedding pillars, a $28 option, and you can also add such extras as base cups (for 360-degree swivel designs), Picatinny rail sections and more. The Game Scout and McMillan Hunter can be inletted for right- or left-hand actions; the Moun-

A new stock can dress up an old favorite and maybe even make it shoot better. The author compared (opp. page) McMillan's Game Scout with painted Speckletone finish and optional adjustable cheekpiece, McMillan Hunter in molded-in McWoody marble finish and (above) Remington Mountain Rifle in a marble finish combining olive, black and tan.

tain Rifle is right-hand only.

Made in the USA, they're built of hand-laid fiberglass, with multiple layers of eight-ounce woven cloth laminated under pressure with epoxy resin. The receiver area is filled with solid fiberglass, and the fore-end is filled with epoxy and glass beads. The buttstock hollow is treated to dense two-piece foam as a filler to deaden sound. I "thwacked" all three with a wooden dowel and did the same to several plain Jane synthetics, and the McMillans were noticeably quieter.

These are custom stocks, and custom doesn't come cheap. Today you could buy a budget rifle for less than what the Remington Mountain Rifle and McMillan Hunter stocks—$593 as tested—would run you. And at $840 as tested, the Game Scout will set you back more than, say, a Remington 700 SPS. However, McMillan also offers less-expensive versions with less inletting and fewer features.

The inletting is outstanding on all three, and they all had a 13.75-inch length of pull. The action dropped in without fuss every time, and action screws started easily. McMillan says it's not necessary to glass-bed barreled actions in its stocks, but there's enough play around the recoil lug area (as there would have to be to accomplish no-fuss installation), I know I'd bed at least around the lug because it would make me feel better.

Finish is great on all samples. As the company notes, you're going to see some mold lines and sanding marks on stocks with molded-in finishes due to the manufacturing process, and these are visible on my samples but not annoyingly so. Paint job on the Game Scout is perfect. Swivel studs screw into metal fittings and include polymer washers between stud head and stock. The Pachmayr Decelerator pads are well fitted.

Following is a look at the individual stocks. I shot each from the bench, offhand, sitting off sticks and prone off a daypack—about a box of ammo per stock. If you're comparing weights, the BDL wood stock I took off the test rifle weighs two pounds, four ounces.

Remington Mountain Rifle Slimmest and lightest of the trio, the Mountain Rifle tips the scales at two pounds, one ounce. The svelte grip is 4.5 inches in circumference and 1.3 inches wide. The fore-end tapers from 1.8 inches wide at the front action screw to 1.2 inches at the tip. The comb is dead straight, and the buttstock's left side is treated to a shadowline cheekpiece. The molded checkering is in a traditional bordered point pattern.

The marble finish—50 percent olive, 25 percent black and 25 percent tan—was well done and gives an overall impression of camo, and in fact I think it looks better than most camo stock patterns. And while I liked the slim grip when I first picked it up, its sweep angle doesn't suit me because the reach to the trigger is too long. I had a hard time getting my finger square to the trigger. In sitting and prone in particular my finger wanted to locate on the outside edge. Granted, I don't have long fingers, but I wear a medium glove so it's not like I'm some freak of nature. However, if it fits your hand better than it does mine, the Mountain Rifle would be an ideal choice for a lightweight hunting rifle.

McMillan Hunter It's done up in a brown-and-black marbled "McWoody" pattern, but that's not what grabbed my attention. This turned out to be a super-comfortable stock for me. Its grip is substantial without overdoing it and features a palm swell. The grip measures 1.7 inches wide at the swell and has a 5.2-inch circumference just above

The Game Scout has a comfy, near-vertical grip and came with an optional adjustable cheekpiece the author really liked.

The optional machined-in bedding pillars provide a rock-solid foundation for your barreled action.

Machine-screw swivel studs screw into metal fittings, and McMillan also offers base cups as an option.

the swell. The fore-end taper is the same as the Mountain Rifle and also has a bordered point molded checkering, although in a different design. Weight is two pounds, four ounces.

I loved how the stock handled in all positions. Yes, Monte Carlos transmit more felt recoil than straight stocks, and I can feel the difference—even in a workaday caliber like the .280. But it's not like I came away feeling as if I'd gone a couple rounds with Joe Frasier (I'm showing my age, I know), even when burning through an old box of Hornady Light Magnums.

I do like palm swells, and this one feels great and puts my trigger finger in the right position with plenty of clearance in all positions.

Game Scout This one had me at hello. I'm a sucker for the paint scheme, a textured process McMillan calls Speckletone—in this case black and tan specks over an olive base. And the optional adjustable cheekpiece...well, I'm beginning to think I'm missing the boat by not having the feature on a lot more rifles.

I have plenty of experience with adjustable-height cheekpieces, but they've always been on competition rifles. The Game Scout's design has me thinking about it as a better (albeit more expensive) hunting rifle alternative to a strap-on cheekpad.

At two pounds, six ounces, it's the heaviest of the bunch because of the extra parts for the cheekpiece and also because it's slightly beefier. The grip is an ambidextrous vertical design with a six-inch circumference and 1.8-inch width at its widest point.

Depending on what you want or need, any of these would be great choices to restock a hunting gun.

At first I thought I wasn't going to like the grip in positions other than prone and from the bench, but I was wrong. It was more than fine from both sitting and offhand. Despite the girth I had no problems getting my finger squarely on the trigger face, and there were no issues with finger drag.

There are two adjustable cheekpiece options available for the Game Scout, one with thumbwheel adjustment and the clamp-style version I had. I do wish there were reference marks to enable you to go right back to your sweet spot after lowering the cheekpiece for cleaning. I love the texturing on the Speckletone finish, although I'd probably add a strip of moleskin on the comb for extended range sessions with rifles that have any level of recoil.

Depending on what you want or need, any of these would be great choices to restock a hunting gun. While the Mountain Rifle wouldn't work for me, the McMillan Hunter and the Game Scout certainly would. I'm having an incredibly hard time deciding which one I would pick. However, if you called me on it, I think I'd go with the McMillan Hunter model but with a Speckletone paint job.

Range facilities provided by Angeles Ranges, ANGELESRANGES.COM.

Leupold's Latest

Every time I think rangefinders can't get better, they get better. The RX-1200i TBR DNA ($500) from Leupold is just one example, and it's a good one. First, 1,200 yards! No, I'm not shooting that far, but when I used it in Kazakhstan last year, it was handy to be able to range distant ibex and figure out how much closer we needed to get.

The 1,200-yard distance is for reflective targets. Nonreflective targets such as deer can be ranged out to 800 yards, with the unit able to range objects such as trees at 900. So if you can't get a reading on a buck or bull way out there, search for a more reflective target nearby.

Another big advantage? An older Leupold rangefinder I have gives both true ballistic range (which factors in your cartridge's trajectory and shot angle) and line-of-sight distance numbers. The 1200i TBR DNA in BAS mode gives only the true ballistic range, which is simpler. Further, I was able to hand the unit to my Kazakh guide—who spoke no English except for numbers—and not have to explain to him which number to give me.

Other mode options for rifle shooters include holdover in inches or mils, m.o.a. scope correction info for dialing up, and simple line-of-sight yardage. Programming for your chosen caliber and load is quick and easy; just select from one of seven "performance groups." You can also change display intensity, units (yards or meters) and, with this model, a last-target mode that ranges the farthest object—which is super-useful. You can also select one of three reticles:

a small Plus Point, Duplex with Plus Point and plain Duplex (my favorite).

I also really like the 6X adjustable eyepiece. Older rangefinders often lacked much if any magnification. At 6X it's much easier to get the unit's reticle locked on a distant animal to get the correct range. All this utility comes in a small and lightweight package; it's just 3.8 inches long and weighs less than eight ounces. It's definitely the best laser rangefinder I've used.—*JSR*

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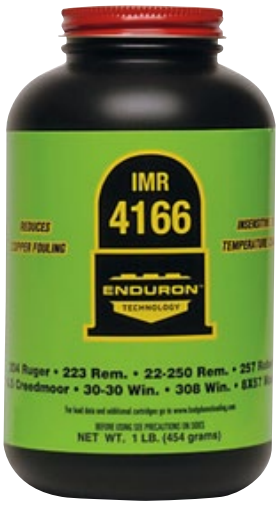
NEW GEAR » J. Scott Rupp

Kimber Adirondack

The model itself isn't new, but two cool chamberings are: 6.5 Creedmoor and .300 BLK. The Adirondack is a light (four pounds, 13 ounces), handy rifle built on the controlled-round-feed 84M action. The stainless steel barreled action sits in a reinforced carbon-fiber stock with a Gore Optifade Forest camo dip. The threaded barrel comes with a protector cap. The Blackout's measures 16 inches (since it's a natural for a supressor) and the Creedmoor's is 18 inches—lengths that make them perfect for woods hunting.
» $1,768, KimberAmerica.com

Federal Vital-Shok Trophy Copper .30-30

Now there's a great new load for this great old cartridge. The polymer-tipped, solid-copper 150-grain bullet provides excellent expansion and weight retention over a broad range of velocities (not that the .30-30 is fast). Its grooved shank increases the likelihood it will shoot well in more rifles, and the polymer tip increases ballistic coefficient for improved trajectory.
» $38, FederalPremium.com



IMR Enduron

This brand-new line of extruded powders features built-in copper fouling eliminator and a small grain size for easy metering and ideal loading density. Not only that, it's insensitive to temperature extremes, and none of the ingredients are harmful to the environment. Currently available as 4166, 4451 and 7977 to tackle a broad range of cartridges. We have a report on this new powder line coming up in next issue's "All That Brass" column.
» IMRpowder.com

Hogue Double Rifle Bag

As the name suggests, this new bag from Hogue Gear accommodates two rifles. Inside, your precious guns are protected by a soft faux suede lining that's diamond stitched over cotton filling. Compartments are separated by a durable foam lining and heavy-duty zipper. The Cordura exterior sports two oversize Cordura pouches with Velcro and five subcompartments secured by a nylon and rubber strap-down system. There are padded handles on the butt and topside, and there are five spots to attach D rings for sling carry.
Available in black or green.
» $260 (46-inch), $270 (52-inch), GetGrip.com

Zeiss Victory SF

The new Victory SF binoculars are all about ergonomics—in addition to some great new glass. They're light, just 27.5 ounces, and the focal point of the lens is shifted rearward for more comfortable viewing. They feature a triple-link bridge design that places the focus wheel in a location that allows the hand to operate the binocs in a more relaxed manner for fatigue-free glassing. Inside there's a new Ultra FL system incorporating two fluoride lenses made with Schott glass, along with a new seven lens eyepiece. » $2,889 (8x42), $2,945 (10x42), zeiss.com/sports-optics

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by David M. Fortier

Getting Buff

HOW TO MODIFY YOUR AR SIMPLY BY CHANGING THE BUFFER WEIGHT.

Inside a standard buffer you'll find three steel weights and three rubber pads. You can change the way your rifle runs by swapping out buffers (from l.): Colt H2 (4.6 ounces); Heavybuffers.com LWRCI's UCIW (5.5), HSS (6.5) and XH (8.2); a standard buffer (3.0); MGI (7.1); and Spike's Tactical ST-T2 (4.1).

Of all the parts on an AR-15, the buffer is perhaps the most insipid. It spends its life hidden in the receiver extension, and when pulled free it does little to cause excitement. Flat on one end, round in the middle, with a "thingy" on the other end, it's rather boring to look at. Shake it next to your ear and you'll hear something rattling about inside. But what does it do, and how can it be hot-rodded to your benefit?

To operate reliably with a diverse array of loads in conditions ranging from extreme heat to extreme cold, even when dirty, requires a careful balancing act. An AR needs to have enough gas tapped off to cycle the action forcefully but not excessively.

If too much gas is tapped off, felt recoil and wear on the mechanism is increased. Too little and the action will not cycle properly, leading to malfunctions, failure to feed or failure of the bolt to lock back on the last round.

Typically, a factory AR carbine will normally be a bit over-gassed to ensure reliable function even in extreme conditions. While being a bit over-gassed aids reliability, it is not always advantageous or even desirable. This is especially true for recreational use or for various types of competition where a lighter-recoiling and smoother-operating cycle is desired. For such use it is possible to tune how the carbine cycles by adjusting the weight of the reciprocating mass: the buffer.

Simply increasing the weight of the reciprocating mass can provide noticeable benefits, including reducing felt recoil and muzzle movement and providing additional mass to aid feeding during the loading cycle. The easiest and most cost-effective way to do this is to simply replace your standard buffer with a heavier model.

If you take apart a standard carbine buffer (which requires only a punch and a hammer: simply drive out the retaining pin and pop off the synthetic pad), you'll find three steel weights and three rubber pads inside. If you weigh a standard buffer, you'll find it's three ounces; the steel weights and the pads account for about 1.9 ounces of that.

Carbine buffers are available in a variety of weights. Colt developed heavier models for certain applications, including the H1 (3.8 ounces), H2 (4.6 ounces) and H3 (5.4 ounces). The H1 uses two steel weights and one tungsten weight, the H2 uses two tungsten and one steel weight while the H3 uses three tungsten weights. If you have a standard buffer and you buy an H3 buffer you can use their weights to build both an H1 and an H2.

Colt's H series is the most common, but there are also other weights and designs available from the aftermarket. My favorite, which I have used for years, is MGI's Rate and Recoil Reducing buffer. The MGI buffer features tungsten weights combined with a spring-loaded shock absorber. Its 7.1-ounce weight (more than twice as heavy as a standard buffer) provides a slight delay in bolt unlock timing. This provides extra time for the swelled case to release its grip on the chamber wall, aiding extraction.

The bolt/carrier/buffer's rearward movement is also slower due to the increased weight. When the MGI buffer strikes the rear of the receiver extension, its mechanical plunger propels the internal tungsten weights forward.

These contact the rearward-moving buffer body (internally) and cause a cancellation of the rearward movement just prior to bottoming out. The masses then come to a complete stop, eliminating much of the felt recoil that would otherwise be transmitted to the shooter.

When the recoil spring drives the buffer/carrier/bolt assembly forward, it is also at a slower speed. This provides additional time for the magazine to present the next cartridge. However, it has greater momentum due to the increased weight, which aids feeding. After the bolt locks, the MGI's internal tungsten weights provide a follow-up hit into the front end of the buffer, eliminating bolt bounce. Felt recoil is noticeably reduced. The only downside is its cost: $165.

Another option is HeavyBuffers.com, which offers a wide variety of AR buffers, 9mm buffers, AR-10 buffers and special designs for Vltor's A5 system and LWRCI's UCIW short receiver extension. The HSS features a stainless steel body, tungsten weights and beefy 6.5-ounce weight. The XH model is the heaviest on the market, tipping the scales at 8.5 ounces—almost three times the weight of a standard unit.

Both the HSS and XH are machined from solid 303 stainless steel and sport a smooth, polished finish. They are assembled using tungsten anti-bounce weights, stainless steel roll pins and synthetic pads. They're nicely made and quite effective. Price is $75 for the HSS and $125 for the XH.

Adding weight to the reciprocating mass is just one possible solution. Another route preferred by competition shooters is to go with a lighter buffer, which reduces felt recoil and allows quicker recovery between shots. However, if you do this, you must replace your standard non-adjustable gas block with an adjustable unit because you have to turn down the gas flow with the lighter buffer.

One option is Taccom's LW AR-15 recoil system, which features a Delrin buffer weighing less than one ounce. Price is $23 for a carbine-length buffer and $25 for a rifle-length buffer.

ANOTHER ROUTE...IS TO GO WITH A LIGHTER BUFFER.

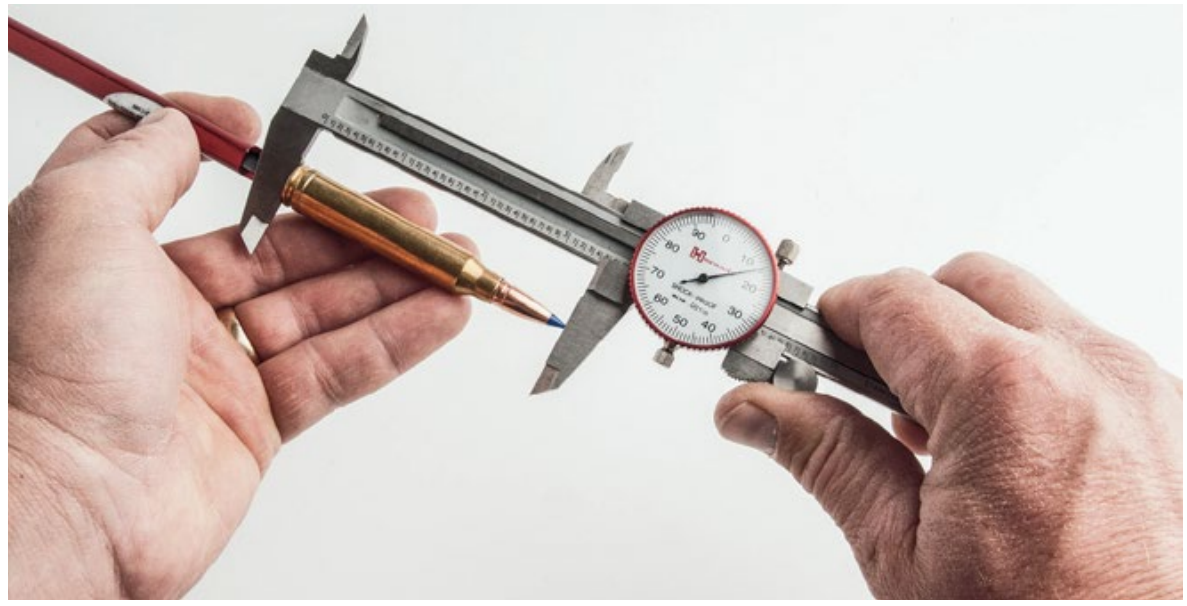
My final thoughts. If it's a service gun, leave it alone. If it's over-gassed, and you don't have an adjustable gas block, adding a heavier buffer can noticeably reduce felt recoil.

If you do have an adjustable gas system, reducing buffer weight can do wonderful things. Don't be afraid to experiment and have fun with Stoner's wonderful creation. ■

by Joseph von Benedikt

Hunting Handload Development

ACCURACY, SPEED AND MORE TO CONSIDER WHEN PREPPING YOUR BIG GAME AMMO.



Every rifle is different, but in general "soft" bullets shoot best seated close to the rifling lead while "hard" bullets shoot better (and safer) seated .020 to .070 inch off the rifling.

Good terminal performance on game—particularly heavy muscled, densely boned big game—is achieved by bullet design characteristics far different from those incorporated into the match-type rifle bullets. Match bullets have thin jackets surrounding soft lead cores, a construction that takes easily to rifling. By contrast, hunting bullets designed for large big game can have tapered jackets, multiple-hardness cores, cores that are bonded (in essence soldered) to the jackets, mechanical core-locking devices swaged into the jacket and often have easily deformed exposed lead tips. All these elements introduce additional variables, and, as we all know, variables are the enemy of consistency and accuracy.

Additionally, many hunting-specific cartridges push projectiles significantly faster than common match cartridges, and burning out your barrel while developing a load is a real possibility, so it doesn't make good sense to try several different projectiles each with several different propellants.

It's more practical to decide on one specific projectile offering the on-game performance you anticipate needing and limit your load development to a few carefully researched propellants and seating depths. In the real world, though, sometimes a specific rifle just doesn't shoot a particular bullet well, so it's worth keeping a Plan B bullet in mind.

Projectile selection should be derived from the game you intend to hunt. Whitetails allow you to go with a "soft" bullet that will expand instantly and dramatically on impact and impart tremendous shock. Excellent choices are Sierra GameKing and Pro-Hunter, Nosler Ballistic Tip, Hornady SST, Remington Core-Lokt, Winchester Power-Point and so on. Such projectiles are relatively inexpensive, and because they're soft like match bullets, it's typically easy to get good accuracy out of them.

If, on the other hand, you commonly hunt bigger, tougher animals with heavy bones such as elk and moose—or the bigger African antelope species—a premium "hard" bullet such as the Nosler Partition or AccuBond, Hornady InterBond or GMX, Barnes TSX or TTSX or Speer Grand Slam is called for. While more expensive, all of those bullets offer the toughness necessary to smash through big bones and still penetrate up to a couple of feet of heavy muscle and vitals.

Tough, deep-penetrating bullets are—because of their complex design characteristics—often more difficult to achieve outstanding accuracy with. Thicker jackets and harder cores don't conform easily to rifling, and multiple-piece designs introduce additional variables that can challenge consistency.

The argument that whatever shoots most accurately out of your rifle is the best because shot placement trumps all—terminal performance characteristics be damned—doesn't hold water. That's pure laziness. No rifleman is perfect, and no hunting scenario guarantees perfect bullet placement, so don't compromise the success of your hunt by choosing to shoot an elk with a whitetail bullet. Excellent accuracy is definitely obtainable with hard bullets; it may just take more load development.

Here are some of the things I've learned for achieving hunting handload accuracy.

Soft Bullets When loading soft,

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fast-expanding bullets for light, thin-skinned big game, try seating them to kiss the rifling leade. Doing so can tighten groups and reduce velocity variation. But don't go overboard. I saw a friend put out of a hunt because he seated his bullets to engrave on the rifling—and sure enough when he went to remove a cartridge from his chamber one day in the field the bullet stuck in the throat. Powder spilled all through the locking lug recesses and the bolt raceways. And then, of course, a beautiful 5x6 bull elk walked out. Really.

Hard Bullets Of the hard bullets listed, the Nosler AccuBond and Barnes TSX/TTSX bullets have enviable reputations for being easy to develop accurate handloads with. However, even they demand special treatment. Like many hard bullets, their denser cores and thicker jackets can cause a pressure spike if seated against the rifling leade.

Thankfully, most hard bullets offer best accuracy when allowed to jump a bit—let's say .020 to .070 inch—to the rifling. The techs at Barnes Bullets, for instance, recommend starting .050 off the rifling, as determined by a seating depth measuring device, and working up or down from there. Use a micrometer-type seating stem in your die to enable precise control of depth adjustments.

I generally start by working up a powder charge at the factory-recommended bullet seating depth. When I've achieved satisfactory velocity, I then vary seating depth up and down .010 per step, loading and shooting three three-shot groups per setting until I'm happy with the group size average.

Finding the seating-depth sweet spot can gain you consistent velocities and low standard deviation numbers. Of course, as you get close to the rifling it can also mess with velocities and pressures, suggesting a retrial with powder charge weights.

It's worth noting that although low standard deviation and extreme spread figures are commonly believed to equal accuracy, it's not necessarily true. I've developed accurate hand-

loads that displayed disconcertingly large standard deviations and more than one with obscenely tight standard deviations that didn't group well. In my experience, it's harder to achieve tight standard deviation numbers with "hard" bullets than with soft-jacketed projectiles, but unless you shoot game past a quarter-mile, standard deviation just doesn't matter much.

On the other hand, if you like pushing the limits and sniping at game way out there, tight SDs are indeed critical. You'll get vertical stringing in your groups otherwise. A mere 50 fps variation from shot to shot can mean the difference between a solid hit and a miss low at 800 yards. Compare a typical BC hard bullet such as Speer's .30 caliber, 180-grain Grand Slam fired at 2,980 fps versus 2,930 fps. At standardized pressure at my home elevation of 5,050 feet, the point of impact difference is six inches. Of course, most long-range hunters choose high-BC soft bullets that open easily at long range, so it's a bit off the point of the discussion.

Powder Choices I find traditional powders such as Alliant's Reloder 19 and Reloder 22 are the easiest with which to achieve great accuracy at a minimum of effort, but current sentiment among serious hunting handloaders is skewed heavily toward propellants designed to shrug off the effects of temperature—such as Hodgdon's Extreme line or IMR's brand-new Enduron line—and understandably so. If you develop a load that groups well and gives small standard deviation figures with Extreme or Enduron powder, you can rest easy knowing you've got all the consistency modern propellants can provide.

Although slow-burning powders generally give the speediest velocities, the faster burning of the propellants suitable for a given cartridge are often the easiest to achieve excellent accuracy with. For example, if you're close but not quite there with Reloder 22, H1000 or IMR 7828 in your preferred magnum cartridge, try Reloder 19, H4831 or IMR 4350. You'll give up a few fps, but you might find a load that prints tight clusters.

RIFLESHOOTERMAG.COM

A PATRIOTIC MOVE

by Jon R. Sundra

MOSSBERG REPLACES ITS ATR AND 4X4 WITH A REDESIGNED—AND BETTER LOOKING—RIFLE: THE PATRIOT.

Michael Anschuetz photo

I have always maintained that at least 80 percent of a rifle's overall visual appeal is determined by its stock. You can have the slickest barreled action on the planet, but if the stock doesn't have the right lines and proportions, it's got two strikes against it from the get-go. And before I get to discussing this aspect with regard to the new Mossberg Patriot bolt action centerfire rifle, I think it's worthwhile to give an example of what I'm talking about.

The best one I can think of was the metamorphosis in 1962 of the Remington Model 721/722 (long and short action respectively) into the Model 700. The 720 series was a remarkable gun—the product of newly applied post-war design and manufacturing processes, resulting in a solid, accurate rifle that was easy and economical to manufacture. Instead of complicated, flat-bottomed forgings with integral recoil lugs, as seen on the 1903 Springfield, 1898 Mauser, 1917 Enfield and Remington's archrival Winchester's Model 70, the 720-series receiver was a simple tube with no projections with an eccentric washer sandwiched between the barrel and receiver to serve as a recoil lug.

But alas, the 721/722's trim barreled action was set into a stock that had all the visual appeal of a 2x4. Not only that, it had a stamped sheet metal buttplate and a one-piece trigger guard/floorplate, also of stamped sheet metal. The latter served no useful purpose other than to seal off what was a blind magazine, a purely cosmetic attempt to suggest a hinged floorplate.

Then came the Model 700. It was essentially nothing more than the

721/722 barreled action set into a sexy new high-gloss stock with a Monte Carlo comb, cheekpiece, pressed checkering and a plastic grip cap and buttplate with white-line spacers. As for the barreled action, the only visible cosmetic change was a new, checkered bolt handle with a rearward sweep to it. Suddenly, the new Remington 700 was arguably a classier, better-looking rifle than the Winchester Model 70, and 90 percent of this transformation was attributable to the stock.

The removable magazine well also serves as a bedding chassis for the receiver, and beneath this chassis are two transverse channels filled with epoxy to strengthen the stock.

In Sundra's opinion, Mossberg was wise to go with a polycarbonate detachable magazine, and he found it easy and fast to load.

ACCURACY RESULTS

MOSSBERG PATRIOT

7MM REM. MAG.	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
FUSION	150	2,965	11	1.45
HORNADY INTERBOND	139	3,045	13	1.90
REMINGTON ACCUTIP	150	3,015	7	2.00
WINCHESTER SILVERTIP	160	2,890	6	2.15

NOTES: Accuracy results are averages of three three-shot groups from a benchrest at 100 yards. Velocities are averages of nine rounds measured 15 feet from the muzzle on a CED Millennium chronograph.

Such is the story with the recently introduced Mossberg Patriot bolt action. It represents not quite the dramatic transformation as the Remington story, but the new Patriot is different enough the Mossberg folks feel justified in calling it a new rifle. I'll let you be the judge.

Mossberg, of course, has been in the thick of the battle royal being waged among Savage, Remington and Ruger and others to produce the most affordable bolt action big game rifle. I'm talking guns with suggested retail prices of less than $450, with some being less than $350.

In the case of Remington and Ruger, their value-priced rifles—the 783 and the American respectively—are totally different animals compared to their respective flagship Model 700 and Model 77 rifles. Savage and Mossberg's guns, on the other hand, employ the same basic action as used in all other models.

This past November I had the opportunity to use the new Mossberg Patriot chambered in 7mm Rem. Mag. on a whitetail hunt in Saskatchewan where over the course of five days I logged 37 hours in a ground blind in temperatures that ranged from five degrees to 15 degrees below zero. I was also able to take the same gun back home with me to test and evaluate under more controlled and pleasant conditions.

The heart of the Patriot is, of course, the action, which is based on a tubular receiver in conjunction with a washer-type recoil lug and a barrel lock nut. Essentially, it's the same system first seen on the Savage 100 series rifles and many others since. There are some who consider any rifle based on a tubular receiver as being somehow inferior to a forged one and therefore the mark of a, well, lesser gun. I would remind this relatively small faction that most American-built bolt action rifles today employ tubular receivers, including the Kimber Model 84/8400 series and the Dakota Model 97, hardly budget-class guns.

And like the Savage, the bolt head is

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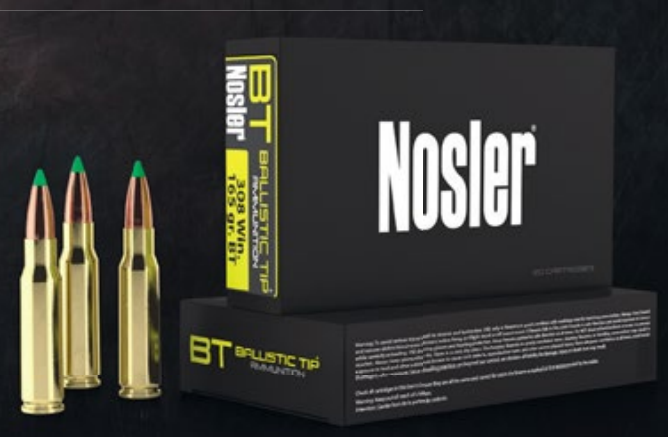

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a separate component secured to the bolt body by a cross-bolt with a hole through its center to allow passage of the firing pin. This arrangement allows the bolt head containing the twin-opposed locking lugs to have a few thousandths lateral play, which allows the lugs to seat themselves perfectly against their abutment surfaces. It's like having a lapped action right out of the box, which certainly can't hurt accuracy.

The bolt body has six functional spiral flutes that, upon rotation, collect any dirt or foreign matter, thus keeping such debris off the bearing surface. And because fluting reduces bearing surface area, friction between bolt and receiver is also reduced. The bolt handle is a departure from Mossberg's previous ATR/4x4 models in that there is no longer a rearward sweep to it. This one little change alone required all stocks—synthetic, walnut and laminate—to be redesigned.

The one thing not changed was the bolt shroud. Before Mossberg acquired the manufacturing rights to this action, the original design of the bolt shroud allowed a decocked bolt to be reinserted into the action. Under this circumstance, the firing pin protrudes from the bolt face, so if the decocked bolt is reinserted into the receiver with enough force and there's a live round chambered, you get ignition without the bolt being in battery—which ain't good! The current shroud prevents this, and while there are other ways to prevent such an occurrence, Mossberg chose to retain this rather unsightly protuberance on the Patriot.

The hammer-forged barrel, which sports six half-hearted 9.5-inch flutes, is free-floated in all three stock options. In all cases there is a polycarbonate bedding chassis on which the receiver sits that is integral with the magazine well. This unit drops into the stock from above. The trigger guard bow on the synthetic model is integral with the stock, while on the wood stocks there is a separate trigger guard bow that is much classier looking. But then the wood models are more expensive than the synthetic.

There's nothing new about the trigger. It's Mossberg's LBA, which is user-adjustable down to two pounds. The two-position side safety does not lock the bolt. The bolt stop/release is as simple and efficient as it gets. It's a

SPECIFICATIONS

MOSSBERG PATRIOT

TYPE	floating-head, twin-lug bolt action centerfire
CALIBERS	.22-250, .243, .25-06, 7mm-08, .270 Win., .308, 7mm Rem. Mag. (tested), .300 Win. Mag., .338 Win. Mag., .375 Ruger
CAPACITY	4+1 (standard), 3+1 (magnum); detachable polycarbonate magazine
BARREL	22 in., 1:10 twist
OVERALL LENGTH	42.75 in.
WEIGHT	7 lb., 6 oz.
FINISH:	matte blue (tested), Marinecote
STOCK	walnut (tested), black and Mossy Oak synthetic, laminate
TRIGGER	single-stage Lightning Bolt Action, user-adjustable to 2 lb.
SIGHTS	none (except .375 Ruger); Weaver-type bases installed; scoped combos available
PRICE	$438 (walnut; tested), $386 (synthetic), $584 (laminate/Marinecote)
MANUFACTURER	O.F. Mossberg & Sons, MOSSBERG.COM

The bolt body is a three-piece affair with a floating bolt head whose play allows a precise fit. The handle has been redesigned and no longer has a rearward sweep.

The shroud on Mossberg centerfire bolts prevents a decocked bolt from being inserted into the action, and the Patriot retains this. The two-position safety doesn't lock the action.

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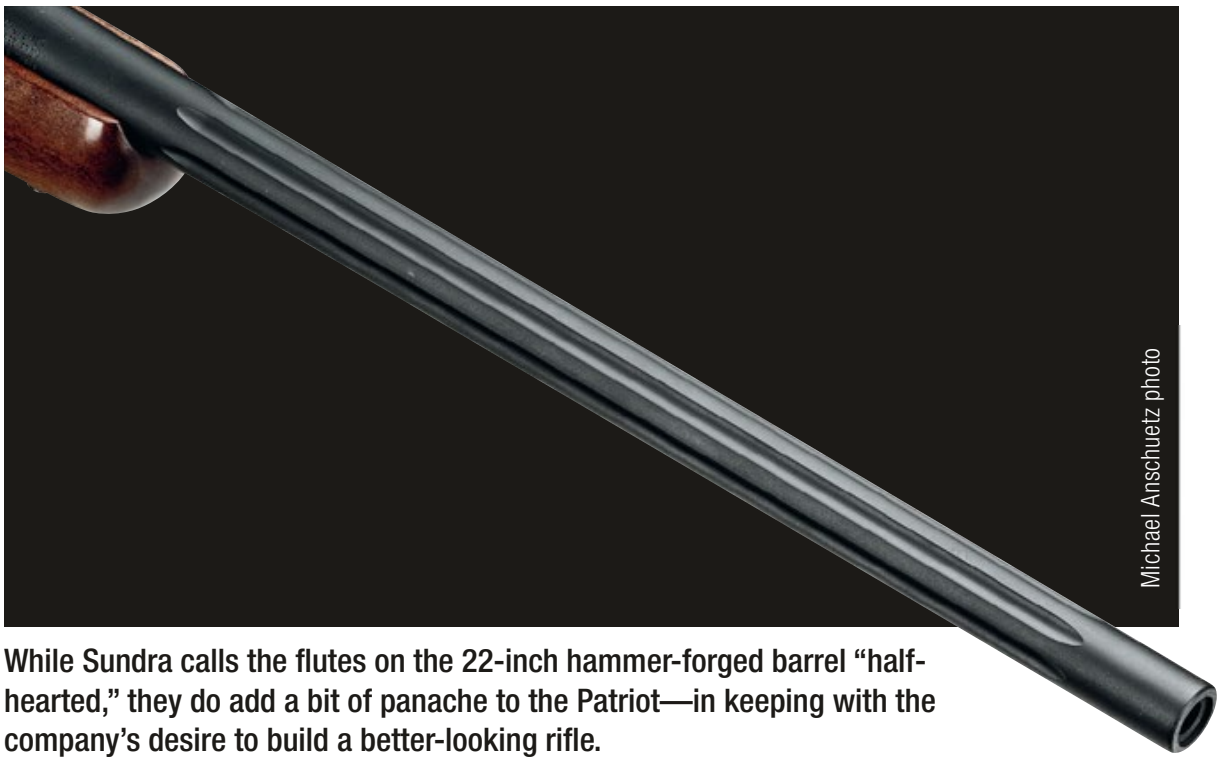
one-piece pivoting blade with an upward extension jutting up just behind the left side of the receiver bridge.

The magazine system is excellent. The entire box is of a one-piece polycarbonate, just like the well into which it fits. I've long maintained that poly magazines are far superior to metal ones because, for one thing, they are incredibly strong yet weigh half of what a comparable metal box weighs. Also, tolerances can be held extremely tight, and the feed lips are integral with the box, so there's no way they can be bent by a drop on a hard surface. The only other components comprising the magazine are the follower, also of polycarbonate, and the follower spring.



While Sundra calls the flutes on the 22-inch hammer-forged barrel "half-hearted," they do add a bit of panache to the Patriot—in keeping with the company's desire to build a better-looking rifle.

If there's a magazine that's easier or faster to charge than this one, I don't know who makes it. I was able to stuff three 7mm Rem. Mag. rounds into this box in four seconds. There's no pushing down on the follower then having to slide the round rearward under the feed lips. You simply push the cartridge straight down. And because all surfaces are so smooth, and the fact there's a natural lubricity to polycarbonate, the effort needed to feed a round from box to chamber is silky smooth, and there's never a slide mark on the case.

But it's the new stock that's going to win over a lot of converts who here-

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tofore simply didn't like the awkward looks of what was Mossberg's flagship rifle, the 4x4.

For the Saskatchewan hunt, I had mounted a Bushnell Elite 2.5-10x40 in Millett rings on Weaver-type bases (which come standard on the Patriot, preinstalled), so the gun was already set for range work. As is common with these hunts where a new rifle is about to be introduced and preproduction guns are being used, the gun arrived only three days prior to my getting on a plane. I was lucky to get in one short sighting-in session using Federal's 150-grain Fusion load, which shot pretty well for the few groups I was able to get in that day. So for formal testing I wanted to sample more of the Fusion, plus a couple other loads of different bullet weights.

At the range everything worked as it should. The trigger broke at three pounds, which is what I prefer on a hunting rifle, so I left it alone. There was, however, a hitch before let-off. It wasn't severe enough to where it affected my shooting. Accuracy was acceptable, but with this being a preproduction example, I believe it will be better on production guns.

THE 7MM AND .300 MAGNUM MODELS SHOULD HAVE 24-INCH SPOUTS.

I expected velocity loss with the 22-inch barrel in 7mm Magnum to be rather severe, and it was—averaging about 90 fps less than nominal. As of this writing, the plan was to fit all Patriots with 22-inch pipes regardless of caliber. I think that would be a mistake, and I'm hoping Mossberg will reconsider before production begins. The 7mm and .300 Magnum models should have 24-inch spouts, otherwise you've got little more than a louder .280 or 30-06.

Other suggestions: change the stock's stippling panels to real checkering, and the pattern on the grip should be larger and more of a traditional point pattern to match the fore-end.

With the Patriot I believe Mossberg has become a more serious player in the value-priced bolt action marketplace. The fact this rifle has gotten the company into Cabela's, Sheels and several large buying groups where heretofore Mossberg centerfire rifles were not carried certainly suggests a new and higher acceptance level. In addition to continuing all the chamberings of the 4x4 line (it and the ATR are gone), the Patriot will be offered in .375 Ruger, a first for Mossberg and another step toward broadening the gun's appeal. It's also available in a shorter, 20-inch-barrel Bantam version, along with scoped combo offerings. ■

A FAMILY AFFAIR

THE .308 WIN. AND ITS OFFSPRING ARE POPULAR FAVORITES FOR ACCURACY- AND PERFORMANCE-MINDED SHOOTERS.

by Layne Simpson

The .308 Win. is an incredibly versatile cartridge in its own right, capable of taking game as large as red stag out to reasonable distances.

Regardless of what products a company develops or invents, there are bound to be a few losers in the mix. Chevrolet had the Corvair, Remington had the EtronX, and Winchester's underachievers include the .225 Win. and the .25 WSSM. Conversely, companies come up with some real winners as well. Winchester has had its share of those, and the .308 Win. is one of the more successful examples.

The .308 story begins shortly after the final shots of World War I had been fired. The development of ball powders by Winchester prompted a search by the U.S. Ordnance Corps for a cartridge more compact than the .30-06 but similar in performance. For a while the .300 Savage was a strong contender, and several experimental rifles were chambered for it. But its case neck proved to be a bit short for preventing bullet slippage under battlefield conditions. So the neck was lengthened by increasing case length another 0.44 inch. And changing the shoulder angle from 30 degrees to 20 degrees made the case easier to form on high-production machinery. The result was a new case with a two-grain increase in water capacity over the .300 Savage.

After about 35 years of development at Frankford Arsenal, the 7.62x51 NATO was finally adopted by the U.S. Army in 1953. It made its first military appearance in 1960 in a modified version of the M1 Garand called the M14 and in the M50 machine gun.

Winchester had been involved in the development of the cartridge since day one, and that, along with blessings from the U.S. government, enabled the company to introduce it to the commercial market as the .308 Win. a couple of years prior to its official military adoption. The cartridge made its debut in the Model 70 rifle, and though it was almost ignored to death by hunters and shooters early on, the stubby cartridge eventually caught on big time. Regardless of whether a popularity chart is based on the annual sales of ammunition or loading dies, the .308 has long ranked among the top five big game cartridges.

While they were developing the 7.62/.308, the technicians at Winchester looked closely at cartridges of other calibers on the same case. The cartridge that became the .243 Win. is almost a spitting image of Warren Page's earlier 6mm Super Pooper, but the genesis of the commercial round came about when word of Remington's upcoming .244 cartridge leaked out. The guys at Winchester quickly necked down the .308 case for bullets of the same .243-inch diameter and introduced it as the .243 Win. in 1955, the same year the .244 was unveiled by Remington.

Loaded with a 100-grain bullet for deer, the .243 took off like scalded dog and has yet to slow down. The .244 leaped from the starting gate and fell flat on the nose of its lighter 90-grain bullet. Based on both reloading die and ammunition sales for rifle cartridges above .224 caliber, the .243 Win. has remained among the top five most popular for the past 54 years.

There are several .243s in our family, but two have accounted for the most game through the years. One, a pre-'64 Winchester Model 70 Featherweight, belongs to my wife, Phyllis. Among her accomplishments with that rifle is a pronghorn antelope so good it took me quite a few years to catch up. My favorite .243 is a Model 15 Ti built around a titanium action by Prairie Gun Works, the Canadian firm. It pegs the scale at 6.5 pounds with scope and is the only rifle of its weight I have owned that consistently shoots three bullets inside a half-minute of angle.

The second .308 offspring was made by necking its case up for .358-inch bullets. In a world of scope-sighted rifles, the grand old Model 71 lever action was growing more obsolete each year and the flat-nosed bullet of its cartridge, the .348 Win., had become old hat. Seeing the handwriting on the wall, Winchester's engineers began designing the Model 71's replacement in 1952 and introduced it in 1955 as the Model 88. During the Model 88's first year of production, it was available only in .308, but the .358 Win. and .243 Win. were added in 1956. The Model 88 and the Model 70 were the only two Winchesters ever chambered for the .358.

Despite the fact that the .358 has always been the Rodney Dangerfield of the .308 family, I like it a lot—perhaps because I almost always pull for the underdog. More likely it's due to a lasting fondness for my Winchester 88 in this caliber. All things considered, the .338 Federal is probably a better cartridge, but the way I see it, if a move is to be made to

(From l.) The U.S. military wanted a cartridge to replace the .30-06, and while the .300 Savage did get a cursory look, ultimately the round that commercially became the .308 won the race. It spawned a number of excellent short-action cartridges: .243 Win., .260 Rem., 7mm-08 Rem., .338 Federal and .358 Win.

a caliber larger than .308, stopping short of .358 makes little sense.

Even with that said, I have a high opinion of the .338 Federal. Back in 1972, Roy Smith experienced an unpleasant encounter with a grizzly while carrying his Winchester 88 in .308 Win., so he rebarreled his rifle for a wildcat made by necking up the .308 case for .338-inch bullets. Several decades later Federal took up the short-action .338 flag.

I first used the .338 Federal on a Colorado elk hunt a few months prior to its introduction in 2006. At the time no factory rifle was chambered for it, so the guys at Federal sent a couple of Sako rifles in .308 Win. to Hart Rifle Barrels for rebarreling. Two loads arrived from Federal, and because the one with the Barnes 185-grain TSX was more accurate, I chose it for the hunt. One shot dropped a bull farther away than I should have been shooting.

The .338 Federal is a great little cartridge, one with performance far exceeding what its appearance might indicate. Even so, its future appears no brighter than that of the .358.

Winchester hit two big home runs when it introduced the .243 and .308, but it dropped the ball by not necking the same case down to 7mm—which metallic silhouette competitors had done long before such a round became a factory cartridge. When it did finally reach factory status, the boxes were green and not red.

Remington introduced the 7mm-08

.308 ALSO-RANS

As you read in the main article, many of the .308 offspring started life as wildcats. One member of the .308 family that never advanced beyond the wildcat stage was the .22-243 Middlestead. Developed and written about during the 1960s by Paul Middlestead, it was created by necking down the .243 Win. case. It generates about 200 fps higher velocities than the .220 Swift when both are loaded with bullets weighing 60 grains and heavier.

Not much is heard from the cartridge these days, but in a 26- or 28-inch barrel with a rifling twist rate of 1:9 or perhaps a bit quicker, it might be fun to load with some of today's extremely long-for-caliber bullets. The .22-243 loaded with the 53-grain Barnes TSX, 60-grain Nosler Partition or 75-grain Swift Scirocco II might be just the ticket for those who use .22 centerfires on deer.

No one seems to know who necked down the .308 case (or necked up the .243 case) and called it the .25 Souper. Few are even aware of it today. Why Winchester never got around to adopting it will never be known, but my guess is it's because it offers no improvement in performance over the .257 Roberts, which has been around since 1934. On second thought, since the .243 Win. won out over the .244 Rem. back in the 1950s, a .257 Win. might have eventually become more popular than the .257 Remington-Roberts (as it was originally called).

Reloading dies for the .22-243 Middlestead and .25 Souper are available from Redding and RCBS. Clymer and JGS Precision have the chamber reamers and headspace gauges.—LS

The .243 Win., here in a pre-'64 Model 70, is one of the most popular deer cartridges of all time and one that remains a favorite even after 54 years of existence.

The 7mm-08, here in a Remington Seven FS, was first a wildcat popular among silhouette shooters. Today it's also known as a capable hunting cartridge and a solid seller.

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BULLET	Bullet Weight (gr.)	Powder Type	Powder Charge (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
.243 WIN. (1)						
SIERRA BLITZKING	70	Hodgdon Varget	40.0	3,419	28	0.74
NOSLER PARTITION	85	Hodgdon H4831SC	44.0	3,064	19	1.25
.260 REM. (2)						
HORNADY GMX	120	Hodgdon H4831SC	45.0	2,862	28	1.15
HORNADY SST	129	Vihtavuori N165	49.0	2,884	18	1.38
7MM-08 REM. (3)						
HORNADY V-MAX	120	Alliant Reloder 15	43.0	2,902	15	0.32
HORNADY SST	139	Ramshot Big Game	48.0	2,751	19	0.40
.308 WIN. (4)						
NOSLER BALLISTIC TIP	125	Winchester 760	52.0	3,029	18	0.29
NOSLER PARTITION	165	Hodgdon Varget	46.0	2,760	29	0.33
.338 FEDERAL (5)						
BARNES TSXBT	185	Accurate 2230	40.0	2,703	26	1.28
NOSLER PARTITION	210	Alliant Reloder 15	46.0	2,472	10	1.33
.358 WIN. (6)						
BARNES TSXBT	200	Hodgdon Benchmark	46.0	2,466	14	1.45
SWIFT A-FRAME	225	IMR 4895	48.0	2,410	17	1.52

NOTES: Accuracy results are for five three-shot groups from a benchrest at 100 yards. Velocities are averages of 15 rounds clocked 12 feet from the muzzle by an Oehler Model 33 chronograph. Hornady cases were used (.260 Remington and .338 Federal were formed from .308 cases). CCI 200 primers were used in all loads. Rifle Legend: (1) Pre-'64 Win. 70 Featherweight, 22 in. barrel; (2) Remington Seven CDL, 22 in. barrel; (3) Jarrett Rem. Seven, 22 in. barrel; (4) Jarrett Rem. Seven, 21 in. barrel; (5) Sako 75, 22 in. barrel; (6) Winchester 88, 22 in. barrel

in the Model 788 rifle in 1980, and it went on to become the second most popular .308 offspring.

I still have one of the first 788s made during that year, and it is the most accurate factory rifle in 7mm-08 I have ever shot. The very first Model Seven FS carbine built by the Remington custom shop also resides in my gun room, and since it weighs only 6.25 pounds with scope, it is better for toting up steep mountains. Through the years I have taken quite a bit of game with the little rifle, but my favorite and most accurate 7mm-08 was built by Kenny Jarrett some years back around a Model Seven action.

Little guys sometimes get trampled in a new cartridge introduction stampede, and the .260 Rem. story begins with just that. Around 1996, Art Alphin of A-Square submitted paperwork on the 6.5-08 A-Square—a .308 necked down to 6.5, as the designation suggests— to SAAMI. A bit later, Remington submitted the .260 Rem., a cartridge on the 7mm-08 Rem. case, which is .020 inch longer than the .308 case. Today there is no 6.5-308 A-Square (nor a .260 Panther, which is what one version of the .260 was also called). Remington obviously won the match.

The .260 Rem. and I got off to a really bad start. The first rifle I shot it in, a Model 700 Titanium Ultimate Lightweight, still holds the record as being the most inaccurate Model 700 I have ever rested atop sandbags. Checking the rifling twist rate of its barrel did not dawn on me, but as I now understand, early rifles had the same 1:10 twist that had worked nicely with rifles in 6.5 Rem. Mag. But the .260 is slower, so the twist rate was increased to 1:8. I later shot the .260 in a couple of other rifles with the quicker twist and had no complaint with their accuracy.

I eventually had a heavy, match-grade barrel in .260 Rem. installed on my switch-barrel Model 700 target rifle. It is quite accurate, but average group size has never quite equaled those fired by the same rifle with barrels of the same make in 6.5-284 Norma and 6.5 Creedmoor. But that's likely nothing more than luck of the draw as a good rifle in .260 Rem. should be able to shoot along with the best of them. I have bumped off three deer, one black bear and several hogs with rifles chambered for this cartridge, and while that does not make me an expert on its capabilities, it seemed to kill all as dead as is possible with any other member of the .308 family.

All things considered from a big game hunter's point of view, the .308 Win. is probably the best all-around choice of the entire clan. When loaded to 3,000 fps or so with the Nosler 125-grain Ballistic Tip, it will hold its own with either of its offspring in pronghorn country. Load it to maximum speed with a good 150-grain bullet and it becomes a darned good deer cartridge. Move up in bullet weight to 165 or 180 grains and it is not a bad elk cartridge at reasonable distances. Owning one rifle in .308 would cover most of the hunting most of us do, but as I long discovered, having rifles chambered for the entire family is a lot more fun. ■

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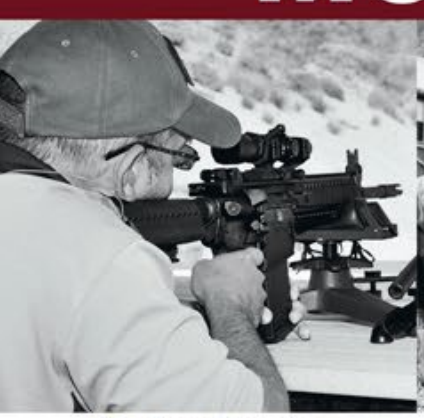

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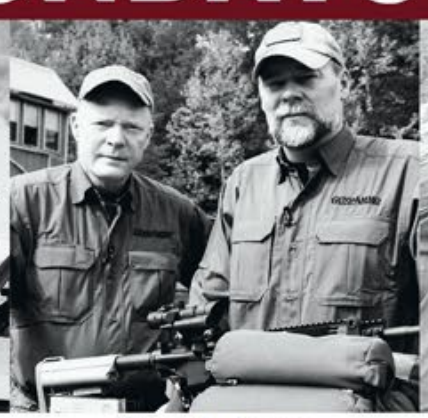

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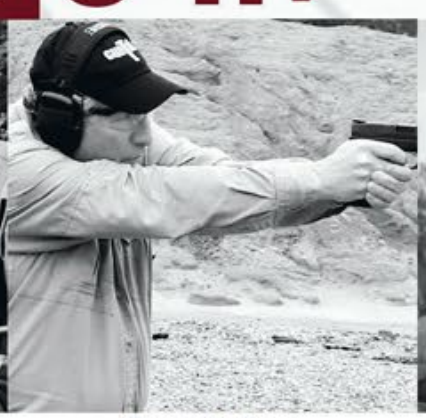

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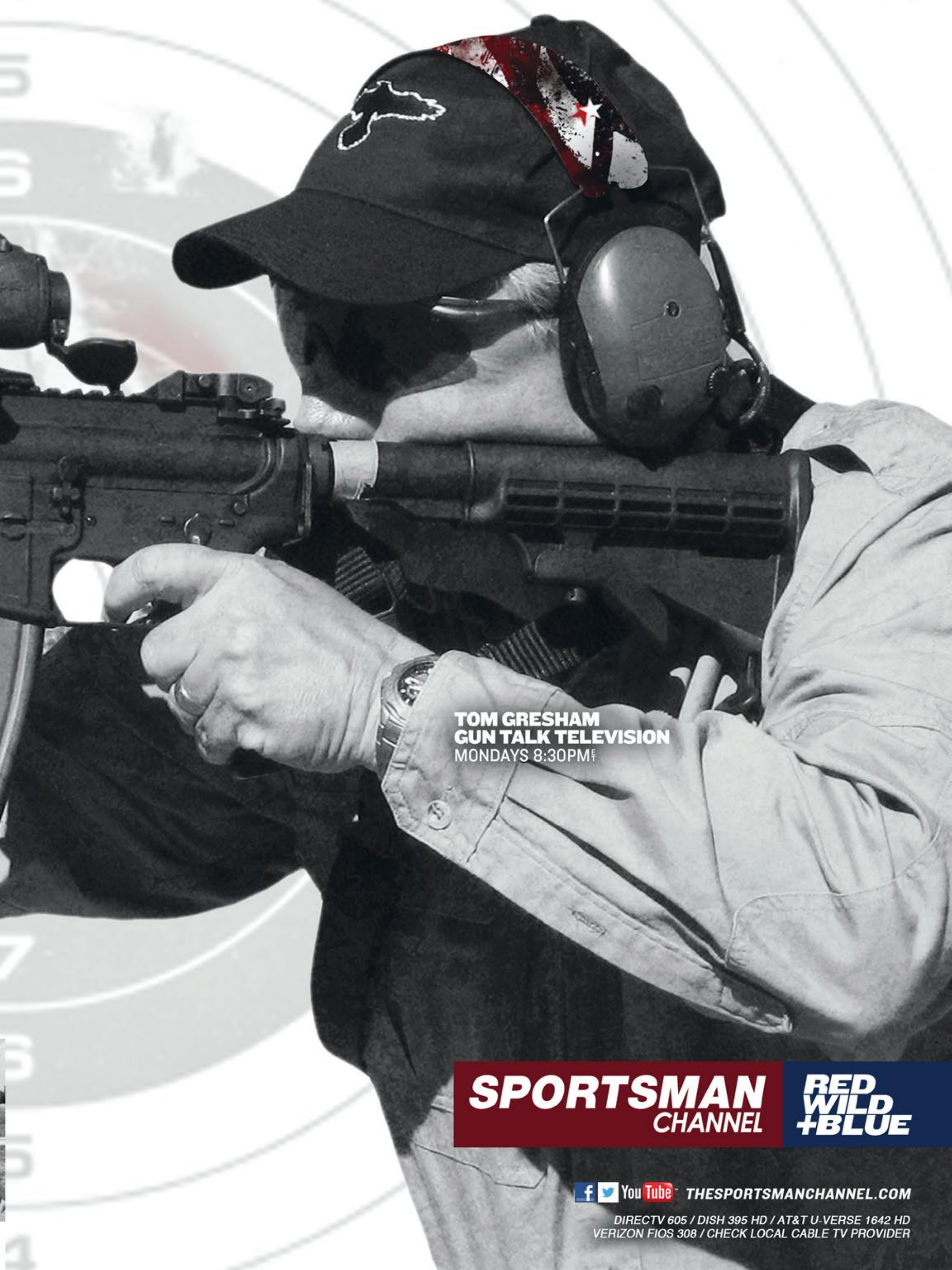
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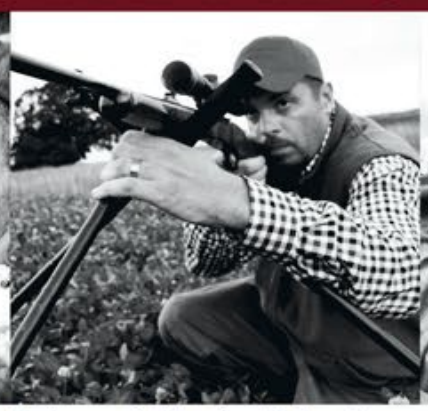

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FOOT-POUND FALLACY

by Craig Boddington

ENERGY PLAYS A ROLE IN CARTRIDGE EFFECTIVENESS, BUT HOW IT'S TRANSFERRED MEANS MORE THAN MERE NUMBERS.

Decades have passed since Col. Townsend Whelen theorized we should have 1,000 ft.-lbs. of energy at the animal to cleanly take deer-size game. This isn't a bad rule of thumb because kinetic energy expressed in foot-pounds is a proven scientific formula: The amount of force required to move one pound one foot.

I have always agreed with Whelen, but not for the obvious reasons. The 1,000 ft.-lbs. standard is not guaranteed to flatten a deer, but provided other factors (like adequate bullet construction) are present, this level of kinetic energy is required to get the bullet into the vitals. And, ultimately, adequate penetration into life-essential organs is the only way to kill game.

Whelen's rule was for deer-size game. Others, me included, have gone further and suggested 2,000 ft.-lbs. at the animal provides a sound minimum for elk, and for 100 years we have established something between 4,000 and 5,000 ft.-lbs. as a sensible minimum for the world's largest game.

Several alternative methods have been promulgated. Some of them are

useful for comparison, but none is quite as scientific as kinetic energy expressed in foot-pounds. Elmer Keith worked the opposite, "pounds-feet" or momentum, which may have some value. John "Pondoro" Taylor's theory of "knock-out value" included little science but did take into account bullet frontal area. Still touted occasionally, his KO value actually has utility in comparing one cartridge to another, but its failure for today's hunter is that it was intended to compare solid, non-expanding bullets and not the bullet designs commonly used now.

How then are we supposed to view energy? Think about it this way. Which is likely to affect you the most: taking a hammer blow just below the sternum or being stabbed with a knitting needle in the same place? The knitting needle is more likely to be fatal, given some time, but the hammer is going to have a much more physical impact on you initially. This is because the hammer develops more kinetic energy, all of which is transferred upon impact.

To my knowledge, we have not found a way to properly evaluate, let alone measure, the transfer of kinetic energy from a projectile to a living target. We do know a surface wound is messy and painful, but, absent infection, not necessarily fatal. We also know perforation of the heart or both lungs is generally fatal, but all experienced hunters have seen heart- or lung-shot animals go for some distance while others drop in their tracks to similar shots.

The whole thing is complicated by the fact that no two living creatures react in exactly the same way upon receipt of a bullet. But while sheer kinetic energy as a number probably isn't as important as we make it, I do think we're missing something vital in not really understanding how much and how quickly energy is transferred.

There are two basic schools of bullet performance: Those who prefer complete penetration and those who want all of the bullet's energy expended in the animal. The latter group is probably also divided into those who like to find their beautifully mushroomed bullets against the skin on the far side and those who are perfectly happy if the bullet goes to pieces as long as it first penetrates into the vitals.

There is a sound rationale for an energy level offering complete penetration in that the resulting exit wound offers better blood trails, and if we're faced with problematic shot angles we can probably count on sufficient penetration. I'm not aware of any testing designed to measure velocities of bullets exiting from targets that simulate game animals, but you have to assume retained energy for any exiting bullet—energy not expended in the animal.

The "stay in the animal" school of thought is an extremely valid argument. Whatever kinetic energy the bullet had was expended inside the animal, regardless of whether the bullet fragmented in the vitals or lodged or against the hide on the far side.

But here is where it gets tricky. If energy transfer from bullet to animal tissue is important—and I believe it is—is there any way to measure it?

Let's look at four scenarios. Bullets A, B, C and D hit the shoulder of a deer with 1,000 ft.-lbs. of remaining energy. Bullet A expands prematurely. It blows up, creating a nasty surface wound only an inch deep. Bullet B also blows up, but it makes it into the chest cavity, with penetration of about nine inches. Bullet C is found against the hide on the far side. (This is a mid-size deer, so penetration is about 15 inches.) Bullet D exits, center punches a sapling on the far side and exits even that.

Bullet A just plain failed, but it transferred all of its energy on impact. The deer may well have been knocked flat by the sheer impact but also may have gotten up and run off. Bullet B didn't exactly fail (depending on what you wanted), but aside from fragmentation, it expended all of its energy during nine inches of penetration. Bullet C held together and fully expended its energy during 15 inches of penetration. It came to rest on the far side because it lacked the energy to penetrate the skin a second time.

You see what I'm getting at? Bullet D did what a lot of folks want their bullets to do, but after exiting the animal it still had enough velocity and energy to penetrate a tree, which does the hunter no good at all. It penetrated well, but clearly expended only a portion of its energy within the animal. If you are of the school desiring through-and-through penetration, you have to accept that bullet energy will be wasted.

Is this bad? Not necessarily. You must decide which bullet performance pleases you and gives you the most confidence.

For sure, overpenetration is better than lack of penetration. In my example, Bullet A is pure trouble, but Bullet D is

fine if it's what you want—and I did want that for many years. Today, however, I'm okay with Bullet B on deer-size game, and I'll take Bullet C across the board. Exit wounds do leak a bit more and expedite tracking, but over the years I have become more convinced I do less tracking when the bullet stays in the animal and expends all of its energy.

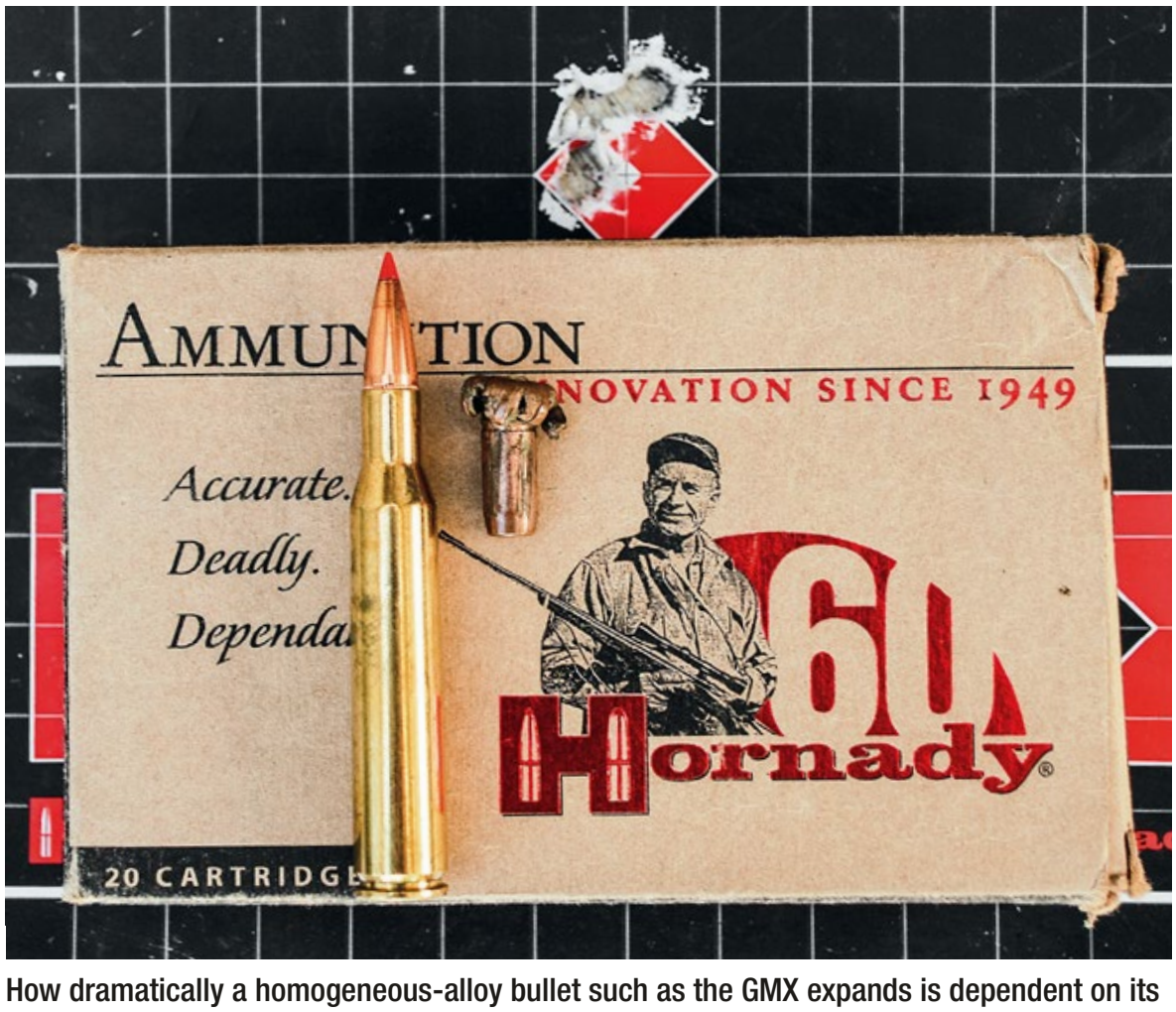
We know bullet shape is critical to ballistic coefficient, which is essentially a comparative measure of a bullet's ability to retain velocity. It is not so widely known that bullet shape also affects energy transfer, and, unfortunately, we can't have it both ways. Sharply pointed bullets are aerodynamic and have higher BCs, but they're the knitting needle from my earlier comparison. Blunt-nose bullets lose velocity more quickly and have a more arcing trajectory, but they are the hammer.

Today most of us shoot spitzer bullets as a matter of course, but if you have any experience with roundnose bullets, you probably know they seem to deal a noticeably heavier initial blow than a spitzer at equal velocity. And in my experience, flat-point bullets hit even harder. I believe we are seeing energy transfer in action.

Obviously, penetration to (or through) the vitals remains essential, but I believe initial energy transfer of traditional blunt-nose bullets is why the good old .30-30 kills deer the way it does despite unimpressive ballistics. And big woods hunters who want to drop deer in their tracks often rely on archaic "brush-busters" such as the .35 Rem., .444 Marlin and .45-70. None of these produce as much kinetic energy as, say, a .270, but they flatten game with authority. Part of it is bullet frontal area, and another part is the blunt-nosed bullet—both of which contribute to a rapid initial energy transfer.

Within the large spectrum of expanding bullets, we simply must take into account bullet design: how much and how quickly they expand. The amount of expansion ultimately determines penetration. The more the bullet expands, the more resistance it meets. Velocity is also a factor because it enables the bullet to overcome resistance, but velocity is also a great enemy to consistent bullet performance. For instance, most .30 caliber bullets perform well at .308 and .30-06 velocities, but some become unreliable bombs in faster .30 caliber magnums.

VELOCITY IS ALSO A GREAT ENEMY TO CONSISTENT BULLET PERFORMANCE.



How dramatically a homogeneous-alloy bullet such as the GMX expands is dependent on its cavity design and impact velocity. After expansion is achieved, they behave much like solids, holding together and penetrating deeply.

Regardless of velocity, however, hunters who desire through-and-through penetration gravitate to tougher bullets that hold together well and don't expand a huge amount. Good examples range from the great Nosler Partition to today's homogeneous-alloy expanding bullets.

Hunters who like to find beautifully mushroomed bullets "against the hide on the far side" are likely to choose bonded-core bullets. Expansion tends to be radical, as much as twice original diameter, but core bonding keeps the bullet together, and weight enhances penetration.

Hunters who want maximum damage to the vitals without undue concern about what the recovered bullet looks like—or exactly where it comes to rest provided it gets to the vitals and dispatches the animal quickly—probably have the widest spectrum of bullets to choose from. Traditional cup-and-core bullets still perform well. Lead-core, polymer-tipped, non-bonded bullets are volatile but often work like lightning striking on deer-size game.

Now we're getting into how quickly the bullet expands. I think this has a lot to do with energy transfer. Regardless of how much they ultimately expand—or how deeply they penetrate—round-nose and flat-point bullets tend to deal the heavy initial blow I spoke of. Polymer-tipped bullets tend to expand quickly because, upon impact, the polymer tip is driven down into the bullet to initiate expansion.

Hollowpoint bullets also tend to

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expand quickly, and I believe rapid expansion also applies to the homogeneous-alloy bullets. Years ago, when the Barnes X was new, I did a couple of cull hunts in Australia. Although expansion is limited in this type of bullet (which today includes Hornady GMX, Barnes TSX and TSSX, Federal Trophy Copper, Nosler E-Tip and more) and penetration is extreme, it seemed then—and still appears—this style delivers a noticeably heavy initial blow out of proportion to the actual expansion.

Whether tipped or not, these bullets are all essentially hollowpoints, with a nose cavity that limits the amount of expansion. My theory is these hollowpoints accomplish their expansion quickly due to their nose cavity and then behave essentially as solids, holding together and continuing to penetrate. These bullets are not everyone's cup of tea because expansion is not radical, and few will be recovered. But they do deliver a heavy initial blow, and on solid tissue, such as a shoulder, you can often hear this in the solid crack of the bullet hitting. I believe this is energy transfer.

Bonded bullets such as the Federal Trophy Bonded Tip produce the classic huge mushroom and maximum energy transfer, but because the core and jacket are bonded, they tend to retain more weight for better penetration.

It is easy to obtain comparative measures of penetration, and recovered bullets can be measured for expansion and weighed for weight retention. It is difficult, perhaps impossible, to scientifically evaluate this business of energy transfer. I do believe it's real, and we can certainly see it in action by shooting water bottles and melons. Measuring it? I don't have a clue, but last year, at the Bisley range in England, I saw a demonstration that got me thinking.

Traditional bullet testing is done in ballistic gelatin or packed wet newspapers. These media show penetration depth but not how quickly a bullet expands or what kind of wound cavity it produces—factors I believe to be key elements in energy transfer. The test I witnessed in England used ballistic soap, which retains an intact wound channel. It was conducted by a Hornady representative and compared only the company's InterBond, InterLock, GMX and SST (all 150 grains in .308 Win.).

Unlike other test media, ballistic soap provides a lasting (and measurable) picture of terminal bullet performance. The large initial wound cavity seems to represent the speed and violence of bullet expansion, which Boddington believes is related to energy transfer

No wider comparison is suggested, and it is accepted this was just a simple demonstration, not a definitive test. But it was interesting nonetheless.

Predictably, the fast-opening SST showed the most distortion, the least recovered weight and the largest cavity diameter: an explosive 4.8 inches. Also predictably, the recovered homogeneous-alloy GMX expanded less than its brethren, retained the most weight (99 percent) and achieved the deepest penetration.

Because the GMX expanded less, its cavity was the smallest at 3.88 inches in diameter, but the distance from entry to maximum cavity diameter was the shortest—just four inches. The difference was not dramatic, but it does seem to confirm my theory that this type of homogeneous-alloy bullet, though more limited in expansion than most lead-core bullets, does its expansion more quickly, perhaps transferring more energy in a shorter distance. Depending on what you want, this does not make it the most perfect bullet. Total penetration was 19.4 inches, meaning it would most likely exit deer-size game.

Second in penetration among these bullets was the InterBond at 16.4 inches, meaning it might exit a deer, depending on shot angle and placement and the size of the deer. The InterLock and SST were equal in penetration at 14.8 inches, which suggests these particular bullets could have been "against the hide on the far side."

The obvious problem with this and most testing media is their uniformity. They can't accurately replicate bones and tissue layers of varying densities, all which change with shot angle and animal size. So, to me, this business of how and when a bullet's kinetic energy is transferred into game animals—and what effect it has—remains unknown. There may not be any definitive way to solve the mystery, but I'm convinced there is much more to it than the sheer number of foot-pounds.

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When the 20-second targets came up, I locked my jawbone against the comb of the M1903-A4 Springfield in an improvised cheek weld, squinted through the three-quarter-inch tube of my "USMC Scope M73G4" and waited until the gusty, fickle wind came full on on the back of my head before squeezing off the shot. Some 300 yards downrange the bank of targets dropped into the pits. I'd barely gotten the shot off in time.

Thirty seconds before they came up again, I thumbed another Hornady 168-grain Vintage Match load onto the floorplate of my rifle, rested my forehead on the open bolt while I took three deep, slow breaths and shut the bolt and got back in the scope just as the targets came up. Waiting out the wind change had paid off. The white spotter disc showing where my last shot impacted was solidly in the 10-ring. Not bad for 100-year-old technology.

I was lying prone on an eyebrow of

TAKING AIM AT HISTORY

VINTAGE SNIPER MATCHES ARE A UNIQUE WAY TO EXPERIENCE PRECISION GEAR FROM DAYS GONE BY.

by Joseph von Benedikt

photo by Michael Anschuetz

a range that clings to a mountainside high in Utah's Rockies, shooting Gibbs Rifle Co.'s M1903-A4 Sniper replica in a vintage sniper rifle competition. Unlike typical across-the-course matches, vintage sniper rifle matches don't use the traditional four positions. All shooting is done from authentic prone positions supported by reasonable front rests, such as sandbags or a steel ammo can rolled up in a wool surplus blanket. Nor is there rapid-fire versus slow-fire: All shooting is done on timed targets.

Few things get a shooter's blood up like shooting at timed targets—unless it's a team event involving timed targets. Most competitions are two-man team events, and team members alternately fire 10 shots each for score at 300 yards and at 600 yards.

Both shooters complete the 300-yard relay—with a two-minute pause to transition from shooter 1 to shooter 2—before moving to the 600-yard line. In most cases, each shooter brings a rifle to the line and gets dialed during the five-minute period for sighters prior

to shooting for score. The nature of the match allows a team to share one rifle if they desire; it had just better be one that maintains accuracy and point of impact as the barrel heats.

Appropriate rifles must be original or mirror original sniper models issued up to and through the Korean War era, including such rifles as the M1903-A4, M1C and M1D Garand (U.S.); the Mosin-Nagant 91/30 PU (Russia/Soviet Union); Gewehr 98 and Karbine 98 (Germany); No. 1, Mk III Series SMLE (Great Britain); M41 (Sweden); and a host of others.

Camp Perry's Vintage Sniper Rifle match is the grandaddy of them all and follows the strict guidelines governed by the Civilian Marksmanship Program. Those guidelines are found in the CMP Games Rules at THECMP.ORG. In essence, only rifles (or replicas thereof) actually designated for sniper use are allowed.

The question of approved scopes is more complex. Obviously, models (and replicas of models) originally issued with sniper rifles are appropriate. According to the CMP's rules, options commonly used in place of issued scopes are acceptable and are listed on the guidelines. However, an option commonly used on a German Gewehr 98 is not allowable as an option on, say, an M1903-A4. All I can say is somebody did a tremendous amount of research in order to form such a comprehensive list of "issued" and "optional" gear.

Depending on the organization hosting the match, rules detailing what scope, mounts and rings and so forth are permissible range from strict to "spirit of the event" tolerance. In CMP-sanctioned matches, only original-type mounting hardware is permissible, although scope rings may be sleeved or modified to accept scopes of non-original diameter.

The strict rules adopted by the CMP in 2011 or thereabouts created some hard feelings among shooters and regional clubs that had been holding vintage sniper rifle matches for years, particularly the ones using to a spirit-of-the-event approach. Suddenly, accomplished shooters with a great deal of passion for the sport were left out for what they considered nitpicky details.

For instance, if the Weaver K-Series scope on a lovingly built Springfield M1903-A4-type sniper rifle read "3X" instead of "2.5X," it wasn't eligible. And it wasn't a question of magnification—Unertl 8X scopes make the cut—it was a question of attention to historical detail. Bases and rings became problematic, too.

Regional organizations also incorporate a lot of flexibility into their match programs. Small matches often adopt a single-shooter format, and some matches are fired at varying distances. Directors of such competitions often couldn't care less whether your scope rings are period correct. As long as your scope and rifle are okay, you face the same challenges as all the other shooters. Such benign attitudes allow a lot of shooters with equipment that wouldn't quite pass historical muster to participate.

On the other hand, rigorous attention to detail is understandable at big matches such as Camp Perry, which is, after all, called the National Matches. The venue is generally thought to represent the pinnacle of the types of competitions hosted there.

All things considered, if you don't already have a rifle set up for sniper rifle competition but want in the game, it's probably prudent to jump through the hoops and set up your rig with period-correct accouterments according to the CMP's guidelines. Then you're home free no matter where you shoot.

Many shooters compete in vintage sniper rifle matches purely for the enjoyment of using various historical firearms. Others get rather competitive and search out the finest possible gear. They tend to post some rather competitive scores, too. At the Utah match I recently attended, Jim Foster posted a 290 out of a possible

This beautiful M1903-A4 is a popular choice for vintage sniper matches, and most are either reproductions or rebuilt on old, cleaned-up actions. This specimen was hand built by gunsmith and writer Reid Coffield using correctly configured new parts on an original action.

ACCURACY RESULTS

GIBB M1903-A4 SNIPER

.30-06	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
BLACK HILLS HPBT	168	2,798	37	1.40
HORNADY A-MAX	168	2,751	29	1.26
HORNADY FMJ	150	2,811	41	2.31

NOTES: Accuracy results are the averages of three consecutive five-shot groups fired from a bench at 100 yards, without allowing the barrel to cool. Velocity figures are averages of 15 rounds measured with a Shooting Chrony chronograph at 12 feet. Abbreviations: HPBT, hollowpoint boattail; FMJ, full metal jacket

300 (individual-shooter program; two 15-shot relays) in heavy, gusting wind to win the match. He used an M1903 Marine Corps sniper replica topped with a Hi-Lux repro of the appropriate 8X Unertl. I was impressed.

Scuttlebutt on the Internet has it that M1903-based rifles have the edge but are more expensive than other options. Original M1903-A4 sniper rifles have tremendous value to collectors, and the reproductions most shooters want cost as much as a nice new deer rifle and scope.

Most are built on old, cleaned-up Springfield actions fitted with brand-new, high-quality barrels and new stocks and mounted with historically correct new-manufacture scope bases and rings. Correctly built, they shoot superbly—the Gibbs Rifle Co. version I'm shooting maintains its point of impact through 15- and 20-round strings and groups better than I can hold—well enough to put me in second place with a score of 285 out of 300 in that same windy match.

Based on my Internet research, the second most popular rifle seems to be the Mosin-Nagant 91/30 PU. Until a year or two ago, original PU snipers in outstanding condition were flowing into the U.S. in good numbers and could be picked up for around $700 or less. Unfortunately, incoming supplies have dried up, and now you'll pay $800 to $1,200 on GunBroker.com.

Fed high-quality ammunition, many of them shoot around a minute of angle, making them quite competitive on the vintage sniper scene. These rifles were hand-selected for accuracy when new and factory-fit with a scope mount that was, legend has it, machined to fit the specific receiver. Beware of surplus PU scopes and mounts that have been cobbled onto common surplus 91/30 rifles. Although they cost far less, they won't have the accuracy needed to shoot sniper competitions.

If you've got the financial wherewithal and are so inclined, original German and British sniper rifles can be found, although they're much less common. They perform superbly as long as they have a good bore and you shoot good ammo. And if you can find a correct Swedish

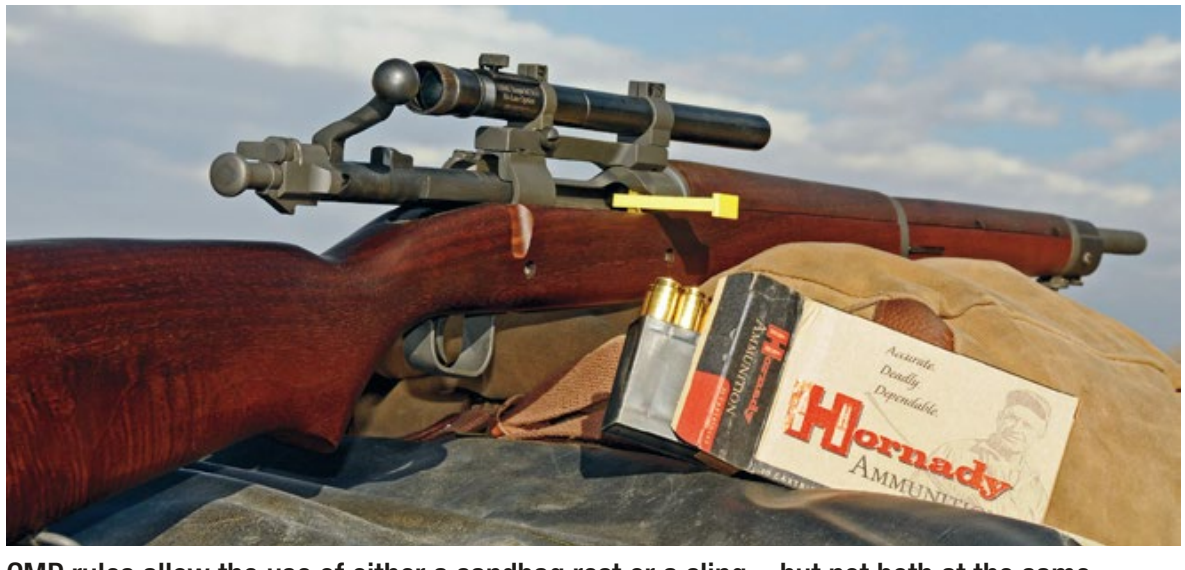
Mauser M41 sniper variant, you'll have the advantage of the 6.5x55's low recoil and a sleek bullet that bucks wind better than the others.

The Gibbs Rifle Co.'s M1903-A4 Sniper ($1,250, AIM Distributors) I used is built on an original 1903A3 action mounted with new four-groove barrels, and it is perhaps the best and simplest way to get right into the vintage sniper rifle game. Carefully installed into new, correct C-type stocks, then beautifully fit with replicas of the original bases and rings, each rifle comes complete with Hi-Lux's reproduction of the M73B1 scope used on the first model M1903-A4 sniper rifles.

Actions and hardware are correctly Parkerized, and the stock is finished in linseed oil. The rifles are marked to distinguish them from original M1903-A4 rifles, with barrels having the current date of manufacture as opposed to attempting to mirror an original.

The Hi-Lux scope is the company's Generation 4 version. It's an exact copy of the original on the outside, modern performance on the inside. The glass in mine is surprisingly good: no color cast, no distortion, and it transfers light nicely. And while its elevation and windage knobs don't exactly track like the turrets on a Nightforce, they are fairly predictable.

Vintage-correct scope adjustments are all external and can be a bit unpredictable. Rules on scopes and mounts can differ, depending on whether you're shooting a local match or a big one like Camp Perry.



CMP rules allow the use of either a sandbag rest or a sling—but not both at the same time—and shooting jackets and gloves are permitted.

As for accuracy, the rifle/scope combo is better than acceptable. Considering the rifle is not glass-bedded (bedding would disqualify it from vintage sniper rifle competitions) and is fitted to a full-length stock (which undoubtedly affects barrel vibrations), it shoots superbly.

In order to evaluate the rifle's ability to hold point of impact as the rifle heated, I fired three consecutive five-shot groups without allowing the barrel to cool. It maintained zero even through 15-shot strings. The accompanying chart shows group size with two different match loads and one full-metal-jacket load.

Speaking of bullets, CMP's rules are wide open. Basically, anything goes except armor piercing, incendiary and other ammo potentially dangerous to pit pullers. Finding something that shoots particularly well in your specific rifle is, of course, of first importance, but if your sweet-spot load happens to push a high-BC projectile that will buck the wind you'll definitely have an edge.

For factory stuff, Hornady offers four popular calibers in its Vintage Match line: 8x57mm (196-grain boattail hollowpoint), .303 British (174-grain BTHP), .30-06 Springfield (168-grain A-Max), and 6.5x55mm Swedish Mauser (140-grain BTHP). All are loaded to appropriate pressure levels for historic sniper rifles and tend to be very consistent. And it's no accident the ammo comes from Hornady. Company ballistician Dave Emary played a key role in shaping vintage sniper competitions at the national level, helping to create CMP's rules and guidelines.

When prepping for a match, it's worth practicing at 300 and 600 yards. CMP rules allow shooters to use either a sandbag front rest or a military-type sling—but not both at once. Most shooters opt for the sandbags (supplied for the match at Camp Perry). Competition shooting jackets and gloves are allowed as well.

Aside from battling the lack of a proper cheek weld, the first thing you'll notice is elevation and windage adjustments on vintage-appropriate scopes often don't track perfectly. Don't assume you can dial up from 300 yards, get zeroed at 600 with a few sighters, and then after the

600-yard relay dial down to the original setting to be perfectly on again at 300. You might be, but just as likely your point of impact will be a shade off.

If I'm in the middle of a relay and notice my shots are a little off, I just tend to compensate by favoring with my crosshair. Making an adjustment in the scope mid-string is just a bit risky, and I prefer to confine my scope adjustments to sighter periods.

Parallax is another factor that plagues shooters with vintage optics. I've read that experienced Mosin/Nagant shooters use the ghost image of the front sight in their field of view to orient their eye the same for every shot. M1903-A4 shooters don't have such a luxury because there's no front sight.

I use a jaw weld—it can't really be called a cheek weld—to help me maintain a consistent eye height in relation to the ocular lens. This helps, but the key is sufficient practice to ingrain muscle memory and assist consistency.

Casual shooting with your rifle also builds consistency and confidence. If you live somewhere with open, public land that permits shooting, wander afield with your vintage sniper rifle and just shoot at targets of opportunity—safe ones, of course, with a proper backstop.

You'll be amazed at how effective such rifles really are, and you'll have a ton of fun becoming better acquainted with yours. After all, while the technology in century-old sniper rifles is, well, old, it was cutting edge in an era that arguably produced America's finest riflemen.

Even though they sport full-length stocks and barrel bands and lack glass bedding, vintage sniper rifles like the Gibbs M1903-A4 can put long strings of match-quality ammo into 1.5 m.o.a. or less

PUSH ON

by Brad Fitzpatrick

CZ-USA GOES THE PUSH-FEED ROUTE WITH ITS NEW 557, AN ECONOMICAL SPORTER THAT DOESN'T CUT CORNERS IN QUALITY OR ACCURACY.

CZ has a history of firearms development dating back to the mid-20th century, but it wasn't until the late 1990s that the company became well known in the United States. In 1998 the company established CZ-USA in an effort to control the brand's future in the American market, and it didn't take long for U.S. shooters to embrace the new company's wide range of firearm offerings.

Chief among these was the CZ 550— a controlled-round-feed bolt-action rifle with a modified double-square bridge Mauser 98 action. Though it was a brand-new gun to most American hunters, the same rifle—under the Brno 602 name—had earned an enviable reputation among African professional hunters, perhaps the most meticulous and cynical of all rifle shooters, with good reason.

The 550 featured a full-length claw extractor and blade ejector and was sturdy enough to house cartridges such as the hulking .505 Gibbs. Despite its impressive history with dangerous game cartridges, the 550 was also chambered for popular cartridges like the .270 Win. and .30-06. Soon the CZ name was being tossed around in conversations about the best bolt action rifles on the market.

Last year, CZ announced it would be offering a brand-new bolt action rifle, one not based on the 550 action. And when the CZ 557 broke cover it wasn't just a freshening or a modified version of the 550—it was a brand-new rifle from the ground up.

The most obvious and most basic change is the action itself. The 557 dumps the Mauser controlled-round-feed design in favor of a push-feed bolt with dual opposed locking lugs, a plunger-type ejector and short extractor. It's similar in basic design to the Remington 700, Savage 110, push-feed Winchester Model 70, Nosler Model 48 and a host of other commercially successful rifle designs.

"We have always had a great product with our controlled-round-feed big game rifles, and they have deservedly earned a very dedicated following among our customers," says CZ-USA's Jason Morton. "The problem is that while the full-length claw extractor is a big advantage for dangerous game, it really isn't needed for the deer and plains game hunter."

This change also marks a major step forward in the development of CZ as a rifle company. The 550 was a modified version of the Mauser 98, so the basic design concept was already in place. The 557's push-feed design was built from the ground-up by CZ's engineering team. And while there's nothing particularly new about the 557's dual front lug design with a short extractor and plunger ejector, it's an important first for CZ and perhaps a more popular CZ option for American hunters.

The war to offer the most accurate rifle for the least amount of money has manufacturers locked in a battle to drop manufacturing costs while providing a gun that shoots well, so I assumed CZ was throwing its hat in that ring. Not so, says CZ's Zach Hein. The 557 was designed to be a higher-end rifle that was accurate and robust with the level of fit and finish that customers had come to expect from the company.

Morton echoes those sentiments.

"There has been a race to the bottom in price with other rifle brands in recent years," he says. "We chose not to go there. In order to build a rifle at the $350 to $450 prices, decisions have to be made that ultimately lower the quality and long-term value of the rifle to a point we don't find acceptable. I don't want to be stuck with a rifle that sacrifices quality, finish or performance to that point, and I won't put hunters who buy our rifles in that position either."

There's nothing revolutionary about CZ's push-feed design, but it is a departure for the company—one it hopes will appeal to American hunters and shooters.

The 557's receiver is CNC machined from billet steel and retains the integral 19mm dovetail scope bases you'll find on the 550. Integral bases offer a solid mounting platform and eliminate the need to buy separate bases, and the rings CZ offers are strong and easy to use. The barrel of the 557 is cold-hammer-forged and factory-lapped, just like the barrel on the 550s. The 557 utilizes an internal box magazine with a hinged floorplate with the release located on the leading edge of the trigger guard. The rifle's bluing is bright and even, and it fared well during range handling.

The Manners carbon stock is textured in the wrist area and the fore-end. It's a classic straight-line stock with no drop.

The bolt is locked in the receiver via a blade at the rear, and the blade must be depressed to release the bolt. The first few times I pulled the bolt out I wrestled with the system, but it doesn't take long to get the hang of the release mechanism, and by the end of two days of testing I could drop the bolt without looking at it. But it's not going to fall out unless you want it to, which is a good thing.

One additional change from the 550 to the 557 is the trigger. The 550's set trigger allowed shooters to push the trigger forward to reduce trigger pull, changing it from kind of heavy to extremely light. It was a polarizing feature; some shooters loved the set trigger while others wished for a good, light, single-stage model.

For those in the latter group, your wish has come true. The 557 features a light, crisp, clean trigger that breaks at a measured 3.5 pounds on the rifle I tested. CZ did its homework here, and the trigger is one of the best you'll find in a production rifle.

The 557 also differs from its predecessor with an excellent single-stage adjustable trigger (not a set trigger like the 550), but it retains CZ's 19mm dovetail base for scope mounting.

Measuring a trigger pull tells only half the story, though. The real test comes at the range when you're punching holes in targets. Really good triggers are so light and clean it's easy to be surprised by the trigger break, and the new 557 has just such a unit. It's user-adjustable for creep, weight and overtravel, but I found it was just fine the way it came out of the box.

The 557's action is smooth and slick, and it's plain to see the fingerprint of CZ's updated CNC machining on the metalwork in this rifle. It features tight tolerances and a smooth, clean finish on the internal parts. Feeding, extraction and ejection were flawless in the rifle I tested, something Morton says was a top priority before the 557 rolled out.

"The 557 feeds more smoothly than the 550 and other controlled-feed rifles," says Morton. "The accuracy potential is greater due to a couple of reasons, the extractor only being one. The tolerances are tighter because the 557s are built on new CNC machinery. Last but certainly not least in today's market, the 557 offers a considerable cost savings over the 550 that we pass on to the consumer."

ACCURACY RESULTS

CZ 557

6.5x55	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
NOSLER TROPHY GRADE ACCUBOND	140	2,556	16.3	0.92
FEDERAL FUSION	140	2,378	17.7	1.20
WINCHESTER POWER-POINT SP	140	2,335	23.1	1.39

NOTES: Accuracy results are the averages of three three-shot groups from a fixed rest at 100 yards. Velocity figures are averages of 10 rounds measured with a ProChrono digital chronograph placed 10 feet from the muzzle. Abbreviation: SP, soft point

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There are two stock options for the 557: traditional walnut and Manners carbon fiber. Although I didn't test the walnut-stocked version, the ones I've seen have good wood and a straight, American-style comb.

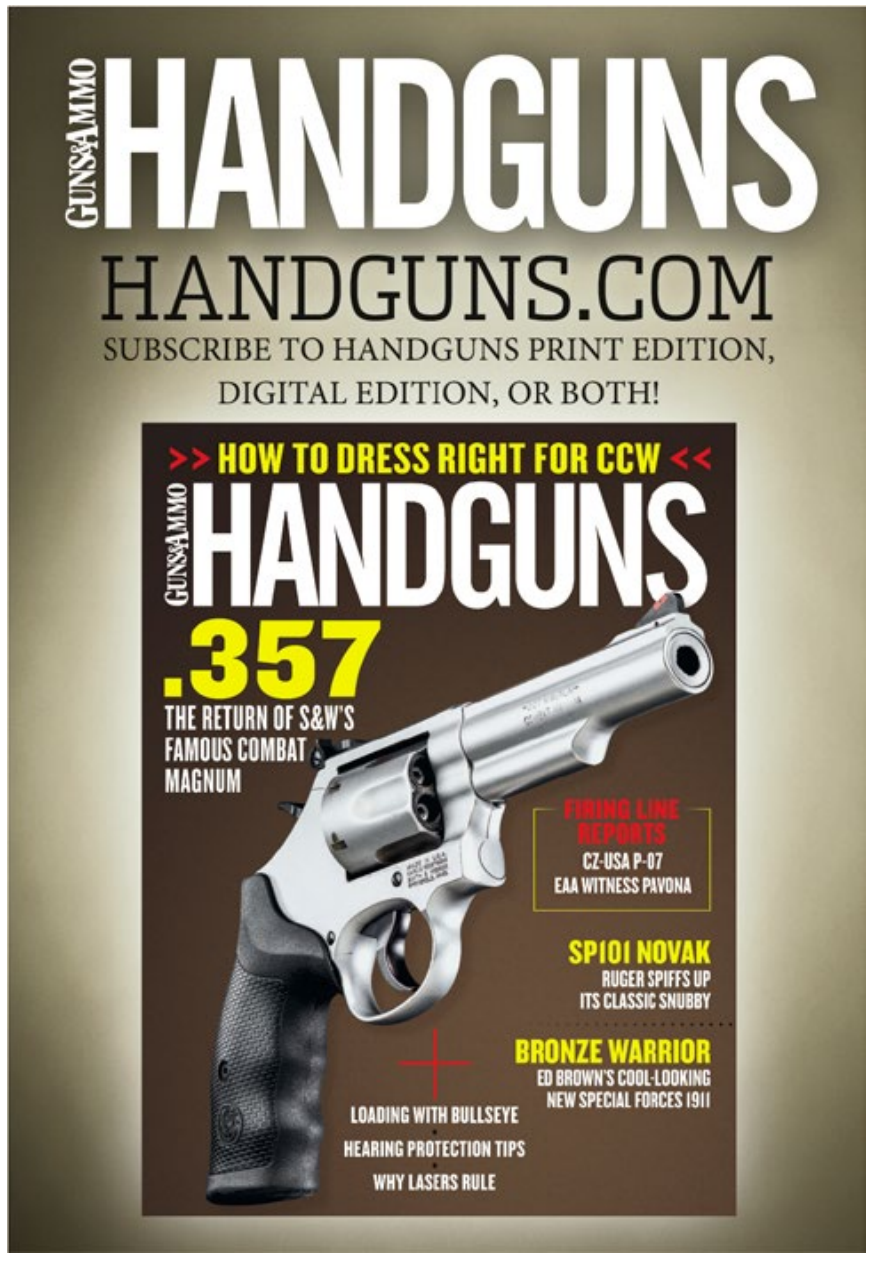
I think the Manners was a good synthetic choice. While many composite stocks on the market rely on the same basic process for production, the Manners stocks are slightly different. Its models are built of the same carbon-fiber material used in wind turbines. The exterior of the stock is a carbon fiber shell, and the interior incorporates light or heavy fill as needed to ensure proper rigidity without excess weight. Action screws are supported 9/16-inch pillars, and the 557's barrel is free-floated.

The 557 didn't disappoint in the accuracy department, averaging under 1.5 inches with all ammo tested. Cycling and feeding were flawless as well.

The tan Manners stock has rippled texturing on the pistol grip and the forend for a secure hold. Like the wood stock, the Manners stock has a straight comb, and it comes with a black Pachmayr recoil pad that does a good job of sucking up recoil.

The pistol grip is also wide enough to provide a stable grip on the gun without crowding fingers, and it's long enough to comfortably grip while shooting even if you have large hands.

One minor difference between the wood and composite stocks is the relation of their combs to the bore axis. The wood stock has a straight comb, but it angles slightly downward toward the recoil pad. The Manners stock has a top line-profile that is parallel to the axis of the bore, a feature Morton says makes it more comfortable to shoot from a prone position.



The rifle I tested was chambered in the light-recoiling 6.5x55 Swede, an old but versatile round that's been the top choice of Scandinavian moose hunters over the last century. The 557 is also available in .270 Win. and .30-06. (Short-action versions in .243 and .308 with hinged floorplates and detachable magazines will be available down the line.)

Suggested retail prices are $792 for the wood stock and $1,268 with a composite stock. There's also a wood-stocked carbine version with iron sights, and it retails for slightly more than the walnut sporter.

On the range, the push-feed action made single loading cartridges easy, and the two-position safety allows you to work the action with the rifle on Safe. I mounted a Trijicon Accupoint 3-9X on the rifle and used three different 140-grain 6.5x55 loads: Winchester soft point, Fusion bonded and Nosler Trophy Grade AccuBonds. The Nosler ammunition produced the best group of the day (0.80 inch), and the Fusion load brought the most consistency with each group measuring between 1.18 and 1.24 inches. Full results are shown the accompanying table.

The rifle felt solid and smooth, from the safety to the trigger and the bolt. The rear of the receiver is enclosed, with a prominent cocking indicator sporting a red ring that juts out directly from the rear of the bolt shroud when the gun is ready to fire. It's easy to identify when the rifle is cocked, and on the range a simple swipe of the thumb was sufficient to know if it was ready to go.

The scope bases and rings held up well, and they were easy to tighten to the proper torque. The soft, black recoil pad made the 557 in 6.5x55 a pleasure to shoot, and I left the bench feeling confident the gun was field-ready.

Some will lament the 557's lack of a full-length claw extractor, but I think offering a push-feed gun at a reasonable price with all these features is a good move. Whether you want a traditional-looking walnut-stocked rifle or a tough composite stock, the 557 has you covered, and it's built to last. ■

SPECIFICATIONS

CZ 557

TYPE	push-feed bolt action centerfire
CALIBER	6.5x55 (tested), .270 Win., .30-06
CAPACITY	5+1 (as tested)
BARREL	22 in.
OVERALL LENGTH	42.5 in.
WEIGHT	7 lb.
STOCK	Manners composite (tested), wood
FINISH	blue
TRIGGER	adjustable single stage; 3.5 lb. pull (measured)
SIGHTS	none; integral 19mm dovetail bases
PRICE	$792 (wood stock), $1,268 (composite)
MANUFACTURER	CZ-USA, CZ-USA.COM

SIMPLY REVOLUTIONARY

POF-USA'S REVOLT TURNS THE AR PLATFORM INTO A BOLT-ACTION RIFLE THAT'S STREET LEGAL EVERYWHERE.

by Patrick Sweeney

When the subject of AR and AR-like rifles comes up, for some reason Patriot Ordnance Factory—better known as POF-USA—doesn't seem to get the love other brands do. I don't understand why. Maybe POF-USA is just too advanced. Frank DeSomma, the owner, is one of those engineering types who leave engineering advances in their wake like some people leave coffee-cup rings on their desks. And his latest innovation, the ReVolt, is proof positive of the company's forward thinking.

The foundation of the ReVolt is the company's Gen4 rifle series, which features a lot of improvements over the basic mil-spec AR design. What you will not find on the ReVolt, regardless of how hard you look, is a self-loading operating system. There's no gas tube, no piston, no gas port. You see, while a cursory glance might have you thinking this is yet another AR, it's actually a straight-pull bolt action.

POF-USA machined a rectangular socket behind the piston thrust shoulder/alignment fin on the bolt carrier. The socket accommodates the charging bar, which features a pair of operating handles at the back for ambidextrous operation. To operate the action, all you have to do is grasp the charging handle and pull back. When you let go, the AR buffer and spring drive the bolt home.

Why convert the country's most popular semiautomatic rifle into a manually operated one? The company wanted to bring to market a rifle to meet the needs of shooters in states where a standard AR is problematic to own. With a ReVolt upper receiver on a mil-spec 5.56/.223 lower, the gun is no longer a semiautomatic and therefore no longer subject to restrictive laws, enabling shooters in problem states to enjoy their rifles and comply with the law. And the complete ReVolt rifle itself is the answer for those who like AR styling and are seeking a super-accurate bolt-action rifle.

Complete rifles are available as the 5.56 ReVolt Light and the 7.62 ReVolt Heavy. A separate 5.56 complete top end will fit any mil-spec lower and ships with a capture pin that replaces the front pin. This pin is easy to install and permanently attaches the receivers to one another while still enabling the rifle to be broken open for cleaning and maintenance in the traditional

AR manner. (Do note that you can, if you live in a nonrestrictive state, simply attach the ReVolt upper using a traditional pin, allowing you to change out uppers as you would on any other AR-15.)

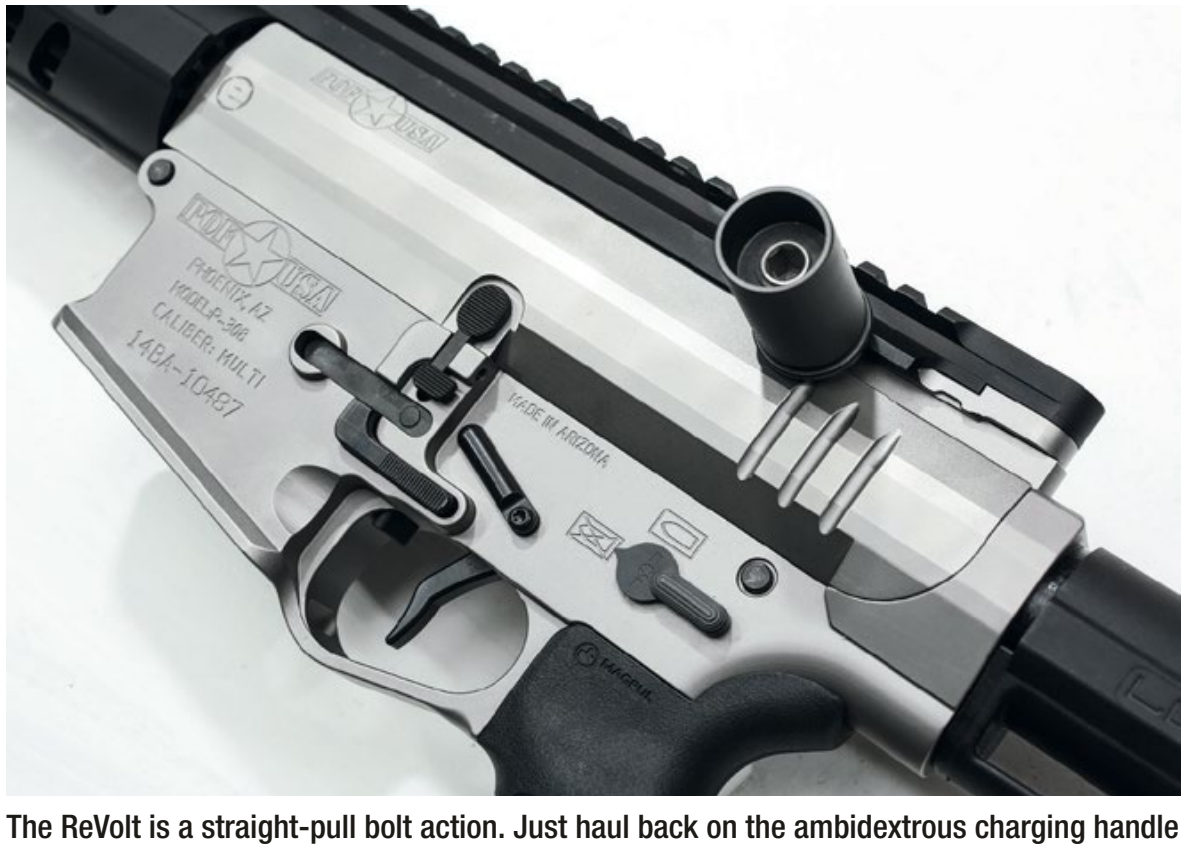
The capture pin is present on complete ReVolt rifles, too, which means you won't be swapping out receivers on those guns. If you bought a ReVolt upper in order to make your mil-spec AR meet state restrictions and then one day move to a more permissive state, you can take the rifle to a gunsmith and have him remove the capture pin. But you won't be able to do it yourself. The same applies if you bought a complete rifle and then move to a place where you can have a swappable-receiver AR.

I received a ReVolt Heavy for review. Beyond its unique operating system, there are a lot of features to like about the ReVolt. It has a free-float handguard, with plenty of cooling slots and removable and attachable Mil Std 1913 rail segments. There's a top rail and forward rail segment, so you can bolt on backup iron sights and still leave room for optics and other accessories.

Inside the handguard is a match-grade, nitride-treated barrel, crafted out of Mil-B-11595 4150 steel, with an oversize barrel nut on the back and a triple-port muzzle brake (also nitride-treated) on the muzzle end. The large barrel nut acts as a heat sink, pulling heat out of the chamber and providing a larger surface area for cooling.

The muzzle brake does an energetic job of dampening felt recoil, but if you don't want it you can always unscrew it and replace it with a plain flash hider or suppressor attachment device. The barrel twist is 1:10, and the muzzle threads are 5/8-24, both standard for a .308.

The barrel is fluted and chambered to 7.62 NATO, and it features POF's Gen 4 E2 extraction technology. Those with a long memory (or who have read deeply) will recall the HK G3 had a fluted chamber. Since the G3 lacked primary extraction, the HK engineers "floated" the case in the chamber by redirecting gases from the case mouth back down the grooves, or flutes, in the chamber. This worked and made extraction possible, but it meant brass



The ReVolt is a straight-pull bolt action. Just haul back on the ambidextrous charging handle and let go. The rifle also features POF USA's innovative Finger Placement trigger, with a bow shaped to put your finger at the best location for leverage.

had a short service life. With the E2, DeSomma and the crew at POF have refined and redefined the design. The four E2 neck grooves in the chamber reduce the friction the case neck experiences—directing gases onto the case shoulder, easing the extraction force needed and increasing reliability. (The company also says the design increases extractor life five times over standard.) The E2 design means every time you work the action you'll be ejecting completely reloadable brass. And the 7.62 NATO chamber means you can use any factory 7.62/.308 ammo without worries. In short, the ReVolt is built to work regardless of the conditions—hot, cold, wet, dry, who cares?

On the back end we have a fully adjustable stock from Luth-AR—a new company from another force in the AR arena, Randy Luth. The stock offers adjustments in cheek riser height and length of pull, and it's significantly lighter than other stocks that do that same. The adjustments are nice, and the lighter weight should be a real crowd-pleaser.

The ReVolt's safety/selector, magazine release and bolt release are ambidextrous, and there's a button inside the trigger guard that locks back the bolt—a positioning that makes this control ambidextrous as well. The trigger guard is integral to the billet-machined lower, and the entire lower is coated with NP3, an electroless nickel/Teflon coating from Robar.

The upper, also machined from billet, is finished with NP3 as well. The upper does include a forward assist, and the brass deflector is a machined wedge, which I think is a whole lot better looking than the pyramid on mil-spec ARs.

The ReVolt's fire control is a single-stage design, and the hammer/trigger combo has been machined and fitted to provide a clean, crisp trigger pull. The trigger also boasts POF-USA's enhanced Finger Placement design, with the trigger bow shaped to put your finger at the best location for leverage.

The hammer and trigger are held in place by KNS non-rotating pins, which reduce wear on the pin holes in the lower receiver. Non-rotating pins are more of a concern for those who have select-fire lowers, but locking down the pins prevents any potential interference with the relationship between trigger nose and hammer sear. Basically, you get a clean, crisp trigger pull for the life of the rifle.

At the rear of the lower receiver interior you'll find two tensioning screws the assemblers use to make sure the fit between the upper and lower is snug without being binding. You won't need to mess with them on a complete rifle, but they could come in handy if you choose to put a ReVolt 5.56 upper on your mil-spec lower.

On the top of the upper receiver, you'll note the optics rail is secured to the top deck of the upper receiver. The rail is also integral to the free-float handguard. This means that, unlike a lot of other designs, the POF-USA free-float handguard does not depend on clamping onto the barrel nut to be securely attached. The extra upper rail reinforces the top of the upper receiver, and the attachment means the free-float handguard is not going to be a source of front-sight wander, and it's a more secure place to mount accessories.

Inside the ReVolt Heavy upper receiver, you'll find a .308-proportioned bolt and carrier. The carrier is nickel-plated for ease of cleaning, low friction

SPECIFICATIONS

POF-USA REVOLT

TYPE	straight-pull bolt-action centerfire
CALIBER	5.56, 7.62 (tested)
CAPACITY	ships with 10-round Magpul magazine
BARREL	18.5 in. nitride finish, 1:10 twist (as tested)
OVERALL LENGTH	40 in.
WEIGHT	9.2 lb.
RECEIVER	NP3-coated anodized aluminum
GRIPS	Magpul MOE
TRIGGER	single stage, 3.5 lb. pull (measured)
SIGHTS	none; integral optics rail
PRICE	$2,680 (Heavy); $2,030 (Light); $1,310 (5.56 separate upper)
MANUFACTURER	Patriot Ordnance Factory, POF-USA.COM

POF-USA's engineers machined a socket into the bolt carrier just behind the piston thrust shoulder/alignment fin. The charging handle's tab fits into the socket.

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and long service life. The bolt, extractor and firing pin are hard-chromed—a wise choice for these high-stress parts. The cam pin has POF-USA's roller-cam feature, which reduces friction.

All this is important because friction between the upper, bolt carrier and roller where they touch has to be so low as to be difficult to measure. The finishes and designs POF-USA employs here accomplish this mission. The low friction eases worries about lubrication—both from the low friction and from the lessened ability of dirt to attach itself to either receiver or carrier. The setup also makes the action buttery smooth and slick.

I worked the action quite a few times before I ever fired a round through it and then quite a bit when testing it, and I'm pretty sure what we have here is the fastest-operating bolt gun ever made. Yes, you do have to pull back harder with this one than with a typical turnbolt—at least in theory, but theory and practice differ. If you want to work a turnbolt quickly, you do it with force. Spring or not, you are going to run the bolt hard. And with the ReVolt, once the bolt is pulled to the rear, you simply let go and get your hand back on the pistol grip as the bolt goes forward.

Better yet, do it left-handed. Prone, from a bipod or rest, you could work the bolt with your left hand (for right-handed shooters; lefties reverse as usual) while firing with your right, and neither one has to leave where it is. If speed of accurate fire is what you're after, I can't see why a shooter who's practiced with the ReVolt couldn't be as fast as someone with a semiauto.

SIMPLY LET GO AND GET YOUR HAND BACK ON THE PISTOL GRIP.

The fully adjustable stock from Luth-AR is the lightest such stock on the market. Adjustments include length of pull and cheek riser height.

The roller portion of the handles on the charging bar is removable, although the underlying stem will remain. If you want only a roller on the right side, you can remove the left-hand one—and vice versa. And in a nifty piece of engineering, the handles themselves function as tools to tighten and remove scope mounts and rail accessories.

I spent my time on the bench punching gratifyingly small groups and running a few drills. My home range doesn't have the elbow room for long-range shooting or for the kind of tactical field shooting where the ReVolt could excel, but what I did manage to do was quite encouraging.

I had just received a delivery of M118LR ammunition, with its stellar 175-grain Sierra MatchKing bullet, which hits the sweet spot in terms of weight and diameter. It is long enough and heavy enough to be accurate at distance but short and light enough to enable the cartridge to feed well in .308 Win.-chambered actions and also be pushed to velocities fast enough to be useful without undue pressure.

It can, however, be picky about the self-loading rifles it plays well with, and that's the beauty of the ReVolt. It's not a semiauto, which broadens your ammo choices. For the same reason I also tested the rifle with Hornady's .308 Superformance. It's wonderful ammo, but some semiautos simply don't like it.

ACCURACY RESULTS

POF-USA REVOLT

.308 WIN./7.62 NATO	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
FEDERAL M118LR MATCHKING	175	2,474	11.4	0.70
FEDERAL XM80 FMJ	149	2,601	9.9	1.25
HORNADY SUPERFORMANCE BTHP	178	2,656	12.3	0.65
HPR JHP	168	2,499	6.8	0.75
BLACK HILLS GOLD BARNES TSX	168	2,510	15.2	0.80
HORNADY MATCH A-MAX	155	2,596	15.9	0.90

NOTES: Accuracy results are averages of five, five-shot groups at 100 yards off a Sinclair front rest and rear bag. Velocities are averages of 10 rounds measured on a PACT MKIV chronograph set 15 feet from the muzzle. Abbreviations: BTHP, boattail hollowpoint; FJM, full metal jacket; JHP, jacketed hollowpoint

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Again, not an issue with the ReVolt. The rest of the ammo I selected with an eye toward seeing how the gun performed with different weights and styles.

I mounted my apparently indestructible Leupold Mark 8 1.1-8x24 scope on the rifle via the equally bombproof LaRue mount. The scope's high-end 8X is plenty good enough to wring out accuracy at 100 yards, and accuracy was what I got—in spades. The muzzle brake wasn't quite efficient enough for me to watch bullet impacts at 100 yards, but I also wasn't being shoved around on the bags. The groups were so good I had to keep myself focused on reticle alignment and trigger press so I wouldn't be distracted by seeing small clusters forming through the scope.

To give you an idea of how well the ReVolt performed, the vanilla-plain M80 ammo the military uses is not noted for brilliant accuracy, so that a rifle could shoot it to just over one m.o.a. is amazing—and the kind of rifle you need to know about.

At no time were there any malfunctions. I did find myself hesitating a few times after breaking a shot, wondering why the trigger was still "dead" on my

The ReVolt is not only revolutionary, it's also super accurate. Even military surplus-grade ammo, not known for punching tiny groups, shot into less than 1.5 m.o.a.—and all the other loads were sub-inch.

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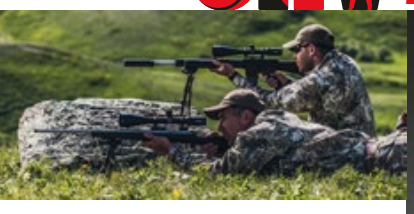

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finger. Then I'd remember I had to work the bolt. Also, it took a while to stop wanting to push the charging handle forward instead of simply letting go and allowing the operating system to do what it's designed to do. If you've run bolt-action rifles for a few decades, the reflex to push after pulling isn't easy to overcome, but eventually I got past it.

The company's specs put the ReVolt Heavy at 9.2 pounds, although my sample measured 9.5 on my scale. At an empty weight of over nine pounds (more with scope, sling, magazine and ammo), the ReVolt Heavy isn't exactly a woods-stalking rifle. While hunting wasn't a primary consideration in designing the rifle, the ReVolt would certainly work well as a hunting rifle when accuracy is a greater concern than weight—such as hunting out of a blind or in the varmint fields. And in those cases weight can be an asset, not a hindrance.

I have a bunch of .30 caliber rifles in the rack that don't tip the scales under 9.5 pounds, and only some of them deliver sub-m.o.a. consistently. So the accuracy results I saw in the ReVolt certainly put it in a class by itself, and for the recreational shooter who wants a tack-driving AR-style rifle not affected by restrictions on military-styled semi-autos, this is your ticket. Ditto for those who hunt in states such as Pennsylvania where semiautomatic rifles are not permitted for hunting. Heck, since it's a straight-pull you could even take it to foreign countries that frown on self-loaders.

Another segment of shooters who might want to check out the ReVolt would be those who are entering precision shooting competitions where bolt guns rule. Here you'd have a rifle capable of rapid fire, allowing you to take advantage of a good wind condition but not be penalized in the reloading arena because you can load right up to published maxes without worrying about high pressure bending the op rod of a gas-driven rifle.

I'll admit, those are somewhat small niches, but many shooters live where it's simply not easy or possible to shoot a standard AR-10 or AR-15, and they need to know about the ReVolt. It's a smokin' hot rifle, with a design (and name) intended to serve the shooting public and tweak the noses of legislators while doing so. Enjoy the nose tweaking.

> THE REVOLT ISN'T EXACTLY A WOODS-STALKING HUNTING RIFLE.

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Thompson/Center Venture Compact

Thompson/Center Arms was among the initial combatants in the current budget rifle war. The company used a lot of the blueprint from its now-defunct Icon—the brand's first bolt gun, superb but relatively expensive—to design a great budget rifle: the Venture. It borrowed the same enclosed receiver, same safety design, same steeply angled bolt shroud and large bolt release on the left side of the receiver and fat bolt design. The Venture even got the Icon's 5R rifled barrel, which has non-symmetrical rifling to reduce fouling, improve bullet stability and help maintain even pressures.

The rifles shared many features, but to reduce costs, instead of the Icon's wooden stock with an aluminum bedding block, the Venture has an injection-molded stock with raised Hogue rubber grip panels and a free-floated barrel.

With the departure of the Icon from the T/C line a few years ago, the Venture had to stand in as the company's flagship bolt rifle. And in a world where rifle companies are judged by their least expensive guns and not their most expensive, the Venture has helped increase T/C's share of the market. The rifle promises one m.o.a. accuracy, which means that at 100 yards you can expect groups under an inch. In addition to the standard blued version, T/C also offers an All Weather version with Weather Shield exterior coating and a camo version with Realtree's MAX-1 or AP Snow dips.

Recently, T/C also announced the Compact, a downsized version of the Venture. It's similar to the standard blued Venture in every way except that it comes with a shortened stock (12.5-inch length of pull) and a 20-inch barrel.

In addition, the Venture comes with a one-inch spacer and an additional recoil pad so the rifle can be adjusted to a longer length of pull. This is a great option when buying a rifle for a youngster. Kids often learn to hunt and

SPECIFICATIONS

THOMPSON/CENTER VENTURE COMPACT

TYPE	bolt-action centerfire
CALIBER	.22-250, .223 (tested), .243, 7mm-08, .308
CAPACITY	3+1, detachable box magazine
BARREL	20 in., 1:12 twist
OVERALL LENGTH	39.75 in.
WEIGHT	6.75 lb.
STOCK	black synthetic with rubber Hogue inserts; 1 in. stock spacer
FINISH	blue
TRIGGER	single-stage adjustable, 3.5–5 lb. pull; 4.2 lb. (measured)
SAFETY	two-position rocker
SIGHTS	none; Weaver-style bases included
PRICE	$537
MANUFACTURER	Thompson/Center Arms, TCARMS.COM

shoot when they are still young enough to require a gun with reduced length of pull, but within a few years these shooters have outgrown their compact guns and are ready for something larger. The Venture Compact allows for an additional inch of length and reduces the need to upgrade to a longer gun.

Increasing length of pull requires removal of the recoil pad and the addition of the extra stock segment. The process is simple, and anyone with basic mechanical skills can accomplish the switch quickly. There is a visible seam between the stock and the addition, but it looks much better than the stackable recoil pad additions seen on offerings from other companies that resemble a lumpy pile of badly burned flapjacks.

Like other Venture rifles, the Compact has a two-position rocker-type safety that allows the bolt to be operated in the Safe position. The large safety lever is comfortable and easy to find, and it's quiet enough that you won't alert game when you're ready to fire. The bolt has a 60-degree lift, and on my sample it worked smoothly. There were no issues with feeding, chambering, extraction or ejection.

I'd count the Venture among the slickest of all budget rifles, and the plastic box magazine is lightweight, easy to load and unload, and it latches firmly in place without extra effort. One of the Venture's best accuracy-enhancing features is a light, creep-free adjustable trigger that breaks at just over four pounds.

The .223 Rem. Venture I tested performed extremely well, although only one brand of factory ammunition produced groups that averaged under an inch. Nosler's 55-grain Varmageddon tipped ammo performed best, averaging 0.76-inch groups, and none of the three groups measured more than an inch with it. Full results are shown in the accompanying chart.

Of course, the 20-inch barrel reduces velocities a bit. If you compare the velocities I recorded during accuracy testing to published factory figures, you'll find they're all lower.

But this is not necessarily a bad thing for the vast majority of hunting, especially where youngsters are concerned, and with this short barrel and short stock you're talking about a rifle weighing a mere 6.75 pounds unloaded and unscoped. Young people and smaller (or weaker) adults will find a rifle in this weight range easier to shoot, handle and carry.

There's an intense battle for the best budget rifle title, and I think the Venture deserves a shot at the crown. It includes price-reducing options like an injection-molded stock, yet the gun feels smooth and well put together. If you're buying a gun your child will continue to use as he or she grows, it's nice to know the gun is built to a high standard like the Venture. And with the Compact version, your arsenal won't need to grow just because your kids do.

The Venture's action is basically the same as the Icon's—fat bolt with 60-degree lift, two-position rocker safety—but the chassis is different.

The Compact features a black synthetic stock with an easily installed one-inch spacer, which in the case of young shooters allows you to add length as they grow.

The Compact is chambered in popular short-action cartridges and feeds from a three-shot detachable polymer magazine that locks securely into place.

ACCURACY RESULTS

THOMPSON/CENTER VENTURE COMPACT

.223 Rem	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
HORNADY V-MAX MOLY	55	2,911	18.3	1.04
NOSLER VARMAGEDDON FLAT-BASE TIPPED	55	2,770	12.3	0.76
WINCHESTER RAZORBACK XT	64	2,863	14.9	1.19

Notes: Accuracy results are the averages of three three-shot groups from a fixed rest at 100 yards. Velocities are averages of 10 rounds measured with a ProChrono chronograph at 10 feet.

Ruger No. 1 Varminter

Looking though my three-ring binder where I keep records of all my handloads, I took notice that my first Ruger No. 1 was purchased in February 1976. Hard to believe that was almost 40 years ago and I still have the rifle—a .22-250 Rem. in the Standard rifle configuration. It has totaled up quite a few woodchucks for me and never failed in the field. Last year—as part of a strategy to bring out the No. 1 in a different chambering every year—Ruger reintroduced the Varminter version in .220 Swift as a distributor exclusive from Lipsey's.

Followers of the No. 1 will take what they can get. In years past the No. 1 was available in six different versions and in a wide variety of chamberings. Now the selection is much more limited. Modeled after the famous Farquharson falling-block rifle, the No. 1 was the brainchild of Bill Ruger, who fancied himself an aficionado of the single-shot rifle. Originally, the gun was to be named the Victorian, but with Bill being Bill and the gun being his No. 1 favorite, the No. 1 designation stuck.

Being a varmint model, the barrel is 26 inches in length and tapers to a pleasing 0.74 inch at the muzzle. At eight pounds, it's a little bit heavier than my Standard models but could still be considered a walking varminter. Since this gun has a heavy barrel, there is no quarter rib and instead sports a pair of target blocks on the barrel that mate perfectly to the Ruger rings included with the gun. I like to attach a pair of Ruger rear offset rings to all my No.1s to provide more wiggle room for eye relief.

Years back, this gun was deemed a "premium" model, and with that went some figured wood to go with the price tag. Today, in order to keep prices in line (over the years the No. 1 has almost tripled in price), the wood is rather straight grained for the most part, although when I looked through the racks of a well-heeled gun store, I did turn up some above-average wood specimens. The finish is smooth and mimics oil done in a satin patina without any dust or any other finishing blemishes. Checkering is executed in a traditional point pattern with more than ample coverage on both the pistol grip area and the fore-end.

SPECIFICATIONS

RUGER NO. 1 VARMINTER	
TYPE	falling-block single-shot centerfire
CALIBER	.220 Swift
BARREL	26 in.
OVERALL LENGTH	42.5 in.
WEIGHT	8 lb.
STOCK	satin-finished American walnut
FINISH	polished blue
TRIGGER	3.5 lb. (measured)
SIGHTS	none; integral barrel blocks w/rings included
PRICE	$1,449
MANUFACTURER	Ruger, RUGER.COM
DISTRIBUTOR	Lipsey's, LIPSEYS.COM

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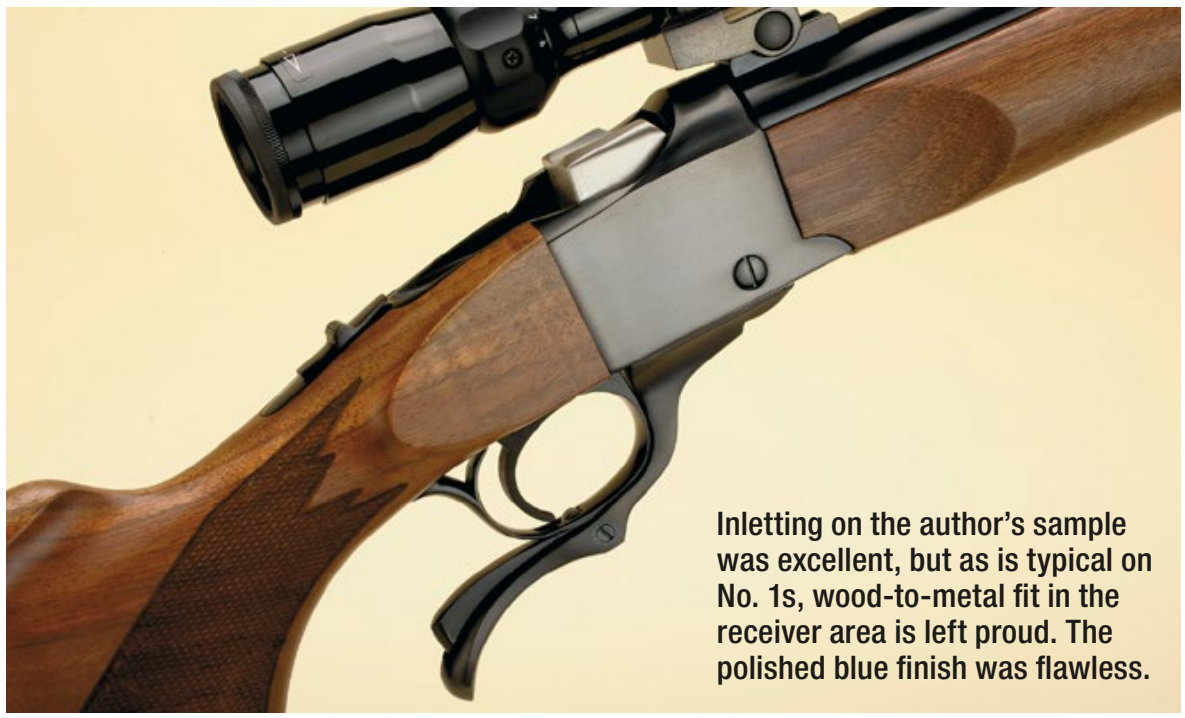
All the inletting is first class in areas such as the tang, receiver, pistol grip cap and around the trigger guard. Around the receiver, you will find the wood is finished "proud," which simply means it is not exactly flush with the receiver flats. It's not a big thing to many, and you have to remember this is a production gun, not a custom rifle. The stock is finished off with a black rubber recoil pad with a black spacer and a black pistol grip cap. Bluing and polishing on all metal parts is flawless.

While the action takes its overall look from the Farquharson rifle, it is modified and scaled-down to modern tastes. Compared to a bolt action rifle, the heart of the action measures only 2.5 inches long and only about 1.5 inches wide at its widest point. Ruger's design team kept the No. 1 trim by moving the mainspring forward, within the protection of the fore-end.



Inletting on the author's sample was excellent, but as is typical on No. 1s, wood-to-metal fit in the receiver area is left proud. The polished blue finish was flawless.

Checkering is a bordered point pattern, with ample coverage on the wrist and fore-end. The wood on this particular rifle showed decent figuring.

Upon cocking the rifle, the falling block drops down and inside the rifle. As the falling block drops down, it protrudes downward from the base of the receiver, as does the spur of the hammer, and you can feel this at the base of the operating lever just forward of the trigger guard, enabling you to tell if the gun is cocked.

The operating lever follows the contour of the Farquharson rifle and matches the curve of the inner trigger guard, then flares downward to follow the lines of the pistol grip. There is a safety located on the tang, which makes the gun a natural for both right- and left-handed shooters. An adjustment on the ejector strut spring allows you to choose whether you want cases ejected or, for handloaders, captured just at the safety lever.

I didn't find the rifle wanting in the accuracy department, and groups were acceptable—certainly a start in the right direction. The Swift is one of my top .22 centerfires for small game, and believe me when I tell you handloading will shrink these groups.

I have six No.1s ranging from commercial to custom wildcats, and to this day, they are my No. 1 choice for varmint hunting. Maybe someday Ruger will bring this gun out in the .204 Ruger. (*Ed. note: The chambering for the 2015 Lipsey's distributor special No. 1 Varminter is .223 Rem. Other configurations and chamberings are available.*)

ACCURACY RESULTS

RUGER NO. 1 VARMINTER

.220 Swift	Bullet Weight (gr.)	Muzzle Velocity (fps)	Standard Deviation	Avg. Group (in.)
HORNADY V-MAX	55	3,589	14	1.00
REMINGTON SP	50	3,801	26	0.75
WINCHESTER SUPER X	50	3,824	42	1.25

Notes: Accuracy results are the averages of three three-shot groups from a rest at 100 yards. Velocities are averages of five rounds measured by an Oehler Model 35P chronograph at 10 feet. Outside temperature was 55 degrees with no wind. Abbreviation: SP, softpoint

The No. 1 design allows shooters to vary the strength of the ejector—kicking cases clear or easing them back so handloaders can easily capture them.

Continued from page 72

available and inexpensive, and Bell does frequently reference the .303—including practicing with a bad batch of ammo by shooting flying ducks. The third, in May 1909, was a .250 Rook. "Rook" is an English word for crow, and the several "rook cartridges" were low-powered, limited-range rounds used primarily for pests in the English countryside. Perhaps this was intended as a quiet little gun for camp meat.

Four .275s in succession came next, but then a great unexplained anomaly. In July 1913, and then again in October of that year, Bell purchased .416 Rigby rifles. World War I intervened, perhaps before the rifles made their way to Africa, but it appears he took at least one of them on his last and only postwar safari, along with the .400 Jeffery.

He wrote about the .400, but mostly by exception. He didn't like the double's heavier triggers or the recoil. Almost nothing is known about his use of the .416s, and no one knows exactly why he purchased not one but two. I am certain there is no mention of either .416 in his several books, but I am told there are letters referencing the presence—if not use—of a .416 on his last safari.

In May 1929 he ordered a Rigby in .220 Swift, which would be an extremely rare Rigby rifle. By this time Bell was comfortably home in Scotland. Most probably he wanted it for varmints, but smallbore man that he was, perhaps he used it for roebuck or even red stag.

Per the Rigby books, his final order was in January 1938, when Bell was 57 years old. It was, again inexplicably, a .318 Westley Richards. Often called the British equivalent of the .30-06, it's actually a bit more than that. Technically, it's a medium bore firing a 250-grain .330-inch bullet. World War II followed soon, but in 1938 was Bell perhaps considering a last sojourn in Africa and recalling fondly the success he'd had with a .318 30 years earlier.

Maybe someone out there knows, but I do not. We remember him as the champion of the 7x57, and clearly he loved that cartridge—but hardly to the exclusivity often ascribed. ■

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by Craig Boddington

Walter Bell's Rifles

Walter Bell was without question one of the most successful of the late 19th and early 20th century ivory hunters. In the Lado Enclave in 1909, Theodore Roosevelt toasted them as a "company of gentleman adventurers," and Bell is perhaps the best remembered. His impressive total—generally believed to be 1,013 elephants—was not the largest bag, nor was his career the longest, but in his case success and lasting legend were to some extent a matter of knowing when to quit.

He didn't die under Dinka spears like C.H. Stigand or to fever like the great Jimmy Sutherland. He used his ivory money to buy an estate in Scotland, and except for a single sojourn to West Africa in the 1920s, he stayed home and enjoyed a long retirement—stalking red stags, painting and writing some of the best accounts of his era.

Walter Bell—properly Walter Dalrymple Maitland Bell and forever known to posterity as "Karamoja" Bell—was born in 1880 and died in 1954. He first went to Africa in 1896 under contract to provide meat for workers, presumably mostly buffalo. From there he went to Canada to the Klondike gold rush. Failing to make a strike, he joined the Canadian armed forces in 1898 and returned to Africa to serve in the Second Boer War.

His serious ivory hunting started when he mustered out in 1901 and essentially ended when he left Africa in 1914 for World War I. So in measuring "success" it must also be considered that he made a fortune in ivory in perhaps 14 years. Without question his success had much to do with athletic ability and superb marksmanship—and perhaps a bit of luck and a lot of determination.

He used a number of rifles, and the total he had experience with is not known. He dabbled with the early 6.5mms, probably both the early 6.5x53R and the later 6.5x54. Like most British subjects, he did a lot of hunting with the .303 British. It is known from his writing that his largest one-day bag was taken with a .318, most likely by Westley-Richards because before World War I the cartridge was pretty much exclusive to that firm. When he returned to Africa in the early 1920s, he used a double .400 Jeffery, again most probably made by Jeffery.

However, he is known to posterity as primarily a "Rigby man" and is linked almost inextricably to his beloved .275 Rigby, the British designation for 7x57 Mauser. Both descriptions are accurate, provided we don't get carried away. Obviously, he owned and used rifles of other calibers and makes. From his writings, he clearly didn't take all of his elephants with a .275, and exactly how many the cartridge accounted for is unknown.

But now that Rigby's records are back in England, a bit of interesting research is possible. Rigby is extremely proud of its association with Karamoja Bell. The firm's managing director, Marc Newton, provided me with an interesting list of 17 firearms shown by Rigby logbooks to be obtained by W.D.M. Bell between 1906 and 1938.

Bell commissioned 13 Rigby rifles and also purchased four other firearms. These included two revolvers—a .22 WRF and .45 Colt—and a Webley & Scott 12-bore. And one more. Interestingly, in 1915 Bell purchased a .303 Lee-Enfield. At the time he was on active service, spending much of the war in Mesopotamia. Bell was a flying officer, so one might speculate that, given wartime shortages, he was unable to get an SMLE issued. In the war he was known to fly low over enemy lines and take potshots with a rifle. (Just perhaps, personal courage was another contributor to his success.)

Let's return to his 13 bespoke Rigby rifles, a large number for anyone. Six were chambered to .275 Rigby, proving his satisfaction with the cartridge. His first .275s were a pair he ordered in September 1910. Without question, he had plenty of experience with the cartridge long before this (including facing the Boers' 7x57s), but these two were his first .275s direct from Rigby. He followed up with another in June 1911 and then a takedown model in August 1912.

His first Rigby rifle, in September 1906 was a .350 Rimless Magnum.

After the war, he ordered two more takedowns, in December 1922 and September 1923. One documented Bell .275 Rigby surfaced at auction a few years ago. I'm certain its owner knows which one it is, but I do not.

And what of Bell's other Rigby rifles? That's where things get really interesting. His first Rigby rifle, in September 1906, was a .350 Rigby Rimless Mag. This is a capable medium bore, seemingly an odd choice for such an avowed smallbore man. Equally odd, I am not aware of any references to this cartridge in Bell's writing.

The second, in February 1907, was a .303. Because of ammo availability, the cartridge always made sense in the British sphere of Africa. Cartridges were

Continued on page 71

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